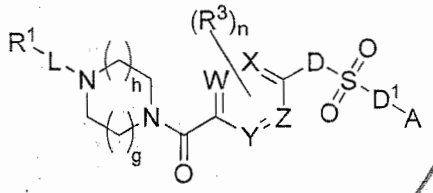
What is claimed is:

1. Use of (1) a compound of formula I or a pharmaceutically acceptable salt thereof; (2) a composition comprising a compound of formula I or a salt thereof, and a carrier or (3) a pharmaceutically acceptable composition comprising a compound of formula I or a pharmaceutically acceptable salt thereof, and a pharmaceutically acceptable carrier: formula (I):



(I)

or a pharmaceutically acceptable salt thereof, wherein:

W, X, Y and Z are each independently selected from CH or N;

D and D^1 are independently selected from a bond or NR^b;

A is optionally substituted aryl or optionally substituted heteroaryl;

L is a bond, -C(O)-, $-(CR^cR^c)_m$-, -OC(O)-, $-(CR^cR^c)_m$-OC(O)-, $-(CR^cR^c)_m$-C(O)-, $-NR^bC(S)$-, or $-NR^bC(O)$- (wherein the point of the attachment to R^1 is on the left-hand side);

R^1 is selected from alkyl, cycloalkyl, aryl, heteroaryl, and heterocyclyl; each of which is substituted with 0-5 occurrences of R^d;

each R^3 is independently selected from halo, haloalkyl, alkyl, hydroxyl and $-OR^a$, or two adjacent R^3 taken together with the carbon atoms to which they are attached form an optionally substituted cyclyl;

each R^a is independently selected from alkyl, acyl, hydroxyalkyl and haloalkyl;

each R^b is independently selected from hydrogen and alkyl;

each R^c is independently selected from hydrogen, halo, alkyl, alkoxy and halo alkoxy or two R^c taken together with the carbon atoms to which they are attached form an optionally substituted cycloalkyl;

each R^d is independently selected from halo, haloalkyl, haloalkoxy, alkyl, alkynyl, nitro, cyano, hydroxyl, $-C(O)R^a$, $-OC(O)R^a$, $-C(O)OR^a$, $-SR^a$, $-NR^aR^b$ and $-OR^a$, or two R^d taken together with the carbon atoms to which they are attached form an optionally substituted heterocyclyl;

n is 0, 1, or 2;

m is 1, 2 or 3;

h is 0, 1, 2; and

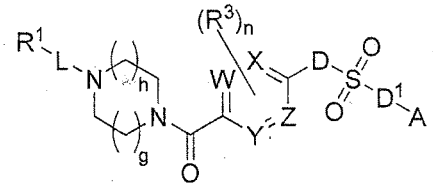
g is 0, 1 or 2,

in the manufacture of a medicament for activating PKR in red blood cells (RBCs).

2. The use of claim 1, wherein the pharmaceutical composition is to be administered to a subject suffering from pyruvate kinase deficiency.
3. The use of claim 1, wherein the lifetime of the red blood cells is increased.
4. Use of (1) a compound of formula I or a pharmaceutically acceptable salt thereof; (2) a composition comprising a compound of formula I or a salt thereof, and a carrier or (3) a pharmaceutically acceptable composition comprising a compound of formula I or a pharmaceutically acceptable salt thereof, and a pharmaceutically acceptable carrier; wherein formula I is as defined in claim 1, in the manufacture of a medicament for regulating 2,3-diphosphoglycerate levels in blood in need thereof, wherein the medicament is formulated for administration to a subject in need thereof.
5. Use of (1) a compound of formula I or a pharmaceutically acceptable salt thereof; or (2) a pharmaceutically acceptable composition comprising a compound of formula I or a pharmaceutically acceptable salt thereof, and a pharmaceutically acceptable carrier; wherein formula I is as defined in claim 1, in the manufacture of a medicament for treating hereditary non-spherocytic hemolytic anemia, wherein the medicament is formulated for administration to a subject in need thereof.
6. Use of (1) a compound of formula I or a pharmaceutically acceptable salt thereof; or (2) a pharmaceutically acceptable composition comprising a compound of formula I or a pharmaceutically acceptable salt thereof, and a pharmaceutically acceptable carrier; wherein formula I is as defined in claim 1, in the manufacture of a medicament for treating sickle cell anemia, wherein the medicament is formulated for administration to a subject in need thereof.
7. Use of (1) a compound of formula I or a pharmaceutically acceptable salt thereof; or (2) a pharmaceutical composition comprising a compound of formula I or a pharmaceutically

acceptable salt thereof, and a pharmaceutically acceptable carrier; wherein formula I is as defined in claim 1, in the manufacture of a medicament for treating thalassemia; hereditary spherocytosis; hereditary elliptocytosis; abetalipoproteinemia or Bassen-Kornzweig syndrome; paroxysmal nocturnal hemoglobinuria; acquired hemolytic anemia, e.g., congenital anemias; or anemia of chronic diseases, wherein the medicament is formulated for administration to a subject in need thereof.

8. The use of any one of claims 1 to 7, wherein the compound is represented by formula (I):



(I)

wherein:

W, X, Y and Z are each independently selected from CH or N;

D and D^1 are independently selected from a bond or NR^b;

A is optionally substituted bicyclic heteroaryl;

L is a bond, -C(O)-, $-(CR^cR^c)_m$-, -OC(O)-, $-(CR^cR^c)_m$-OC(O)-, $-(CR^cR^c)_m$-C(O)-, $-NR^bC(S)$-, or $-NR^bC(O)$- (wherein the point of the attachment to R^1 is on the left-hand side);

R^1 is selected from alkyl, cycloalkyl, aryl, heteroaryl, and heterocyclyl; each of which is substituted with 0-5 occurrences of R^d;

each R^3 is independently selected from halo, haloalkyl, alkyl, hydroxyl and $-OR^a$ or two adjacent R^3 taken together with the carbon atoms to which they are attached form an optionally substituted cyclyl;

each R^a is independently selected from alkyl, acyl, hydroxyalkyl and haloalkyl;

each R^b is independently selected from hydrogen and alkyl;

each R^c is independently selected from hydrogen, halo, alkyl, alkoxy and halo alkoxy or two R^c taken together with the carbon atoms to which they are attached form an optionally substituted cycloalkyl;

each R^d is independently selected from halo, haloalkyl, haloalkoxy, alkyl, alkynyl, nitro, cyano, hydroxyl, $-C(O)R^a$, $-OC(O)R^a$, $-C(O)OR^a$, $-SR^a$, $-NR^aR^b$ and $-OR^a$, or two R^d taken together with the carbon atoms to which they are attached form an optionally substituted heterocyclyl;

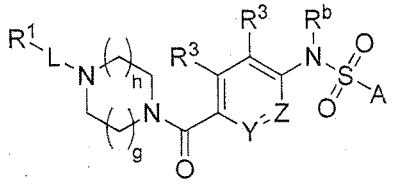
n is 0, 1, or 2;

m is 1, 2 or 3;

h is 0, 1, 2; and

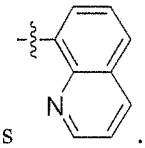
g is 0, 1 or 2.

9. The use of claim 8, wherein h is 1 and g is 1.
10. The use of claim 8, wherein W, X, Y and Z are CH.
11. The use of claim 8, wherein D is NR^b and D^1 is a bond.
12. The use of claim 11, wherein R^b is H, methyl or ethyl.
13. The use of claim 8, wherein L is a bond, $-(CR^cR^c)_m-$, $-NR^bC(O)-$, $-(CR^cR^c)_m-C(O)-$, $-C(O)-$, or $-O(CO)-$.
14. The use of claim 13, wherein L is a bond and R^1 is alkyl, aryl or heteroaryl substituted with 0-5 occurrences of R^d.
15. The use of claim 13, wherein L is $-(CR^cR^c)_m-$ and R^1 is cycloalkyl, aryl, heteroaryl or heterocyclyl substituted with 0-5 occurrences of R^d.
16. The use of claim 13, wherein L is $-NR^bC(O)-$, R^b is hydrogen and R^1 is aryl substituted with 0-5 occurrences of R^d.
17. The use of claim 13, wherein L is $-(CR^cR^c)_m-C(O)-$ and R^1 is cycloalkyl, aryl or heteroaryl substituted with 0-5 occurrences of R^d.
18. The use of claim 13, wherein L is $-C(O)-$ and R^1 is aryl, alkyl, or heteroaryl substituted with 0-5 occurrences of R^d.
19. The use of claim 13, wherein L is $-OC(O)-$ and R^1 is alkyl, aryl or heterocyclyl substituted with 0-5 occurrences of R^d.
20. The use of claim 13, wherein L is $-(CR^cR^c)_m-OC(O)-$ and R^1 is heterocyclyl or cycloalkyl substituted with 0-5 occurrences of R^d.
21. The use of claim 8, wherein n is 0.
22. The use of claim 8, wherein n is 1 and R^3 is CH_3, CH_2CH_3, OCH_3, OCH_2CH_3, OH, F, Cl, or CF_3.
23. The use of any one of claims 1 to 7, wherein the compound is represented by formula (Id):

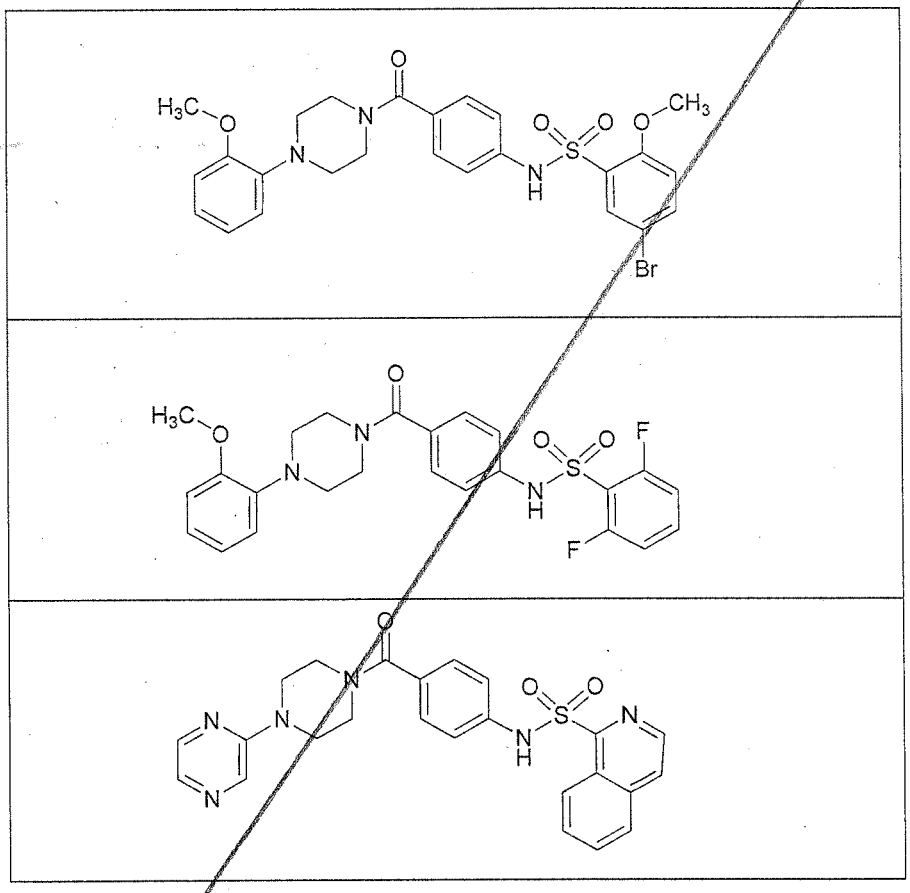


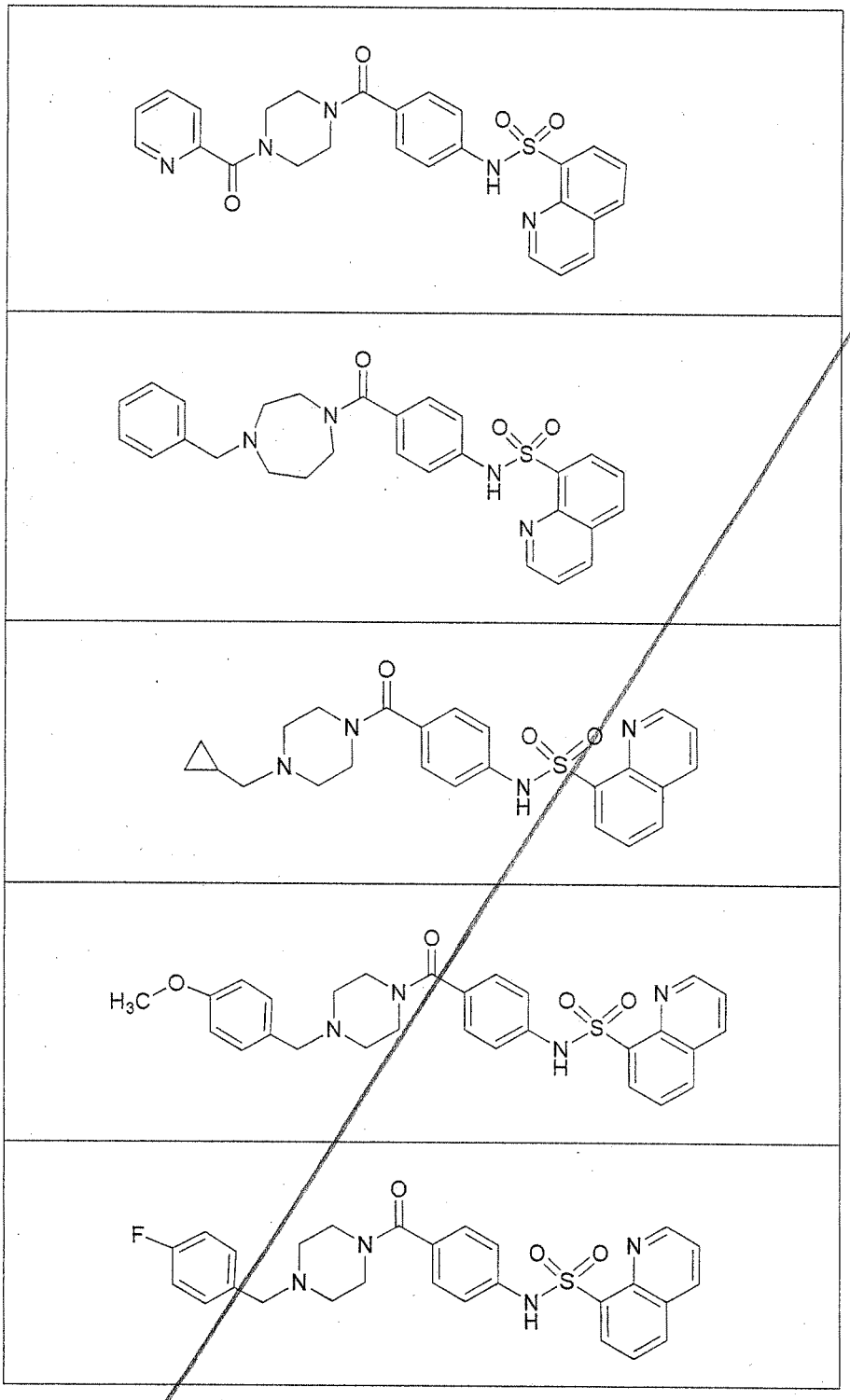
(Id).

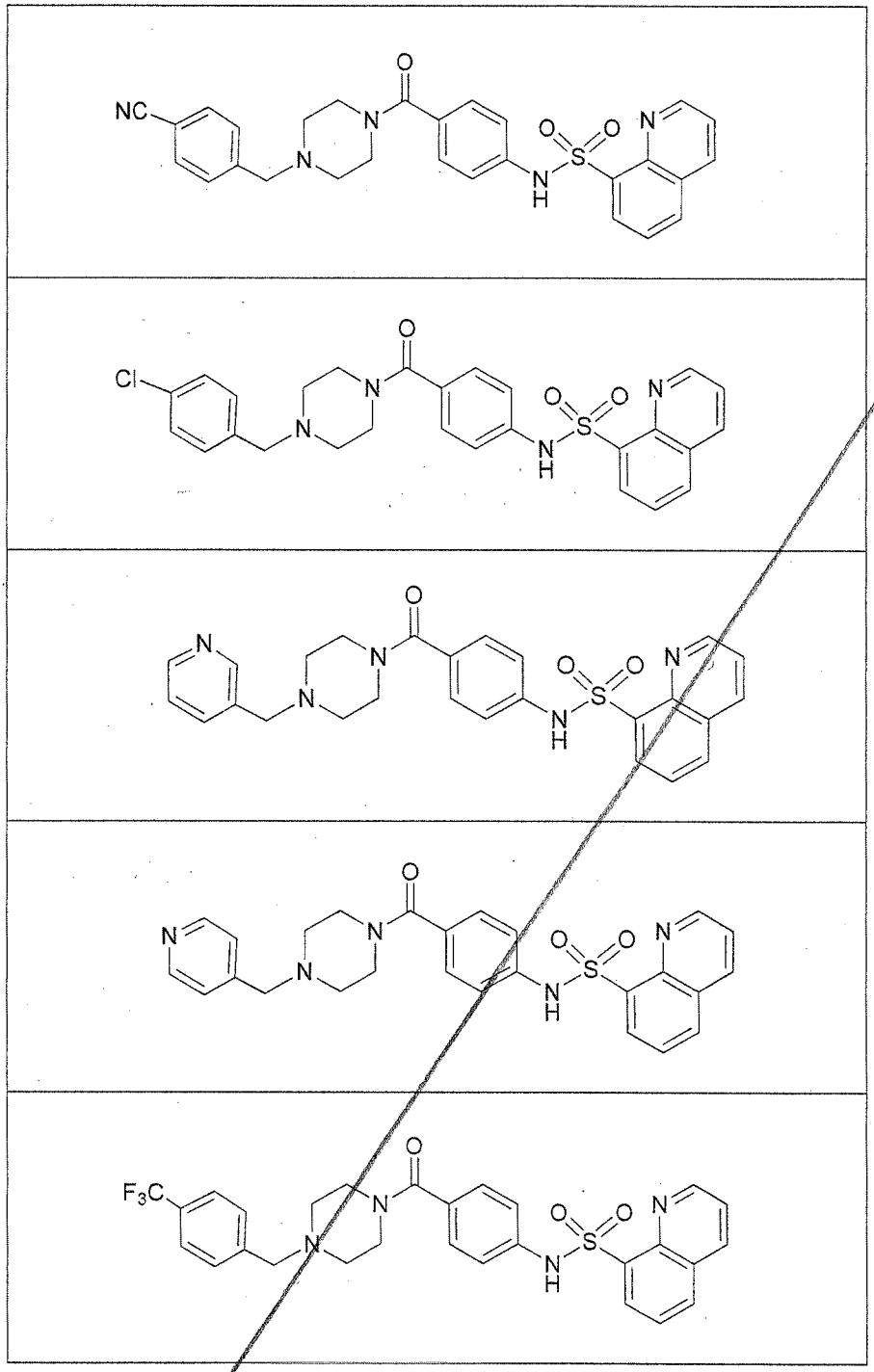
24. The use of claim 23, wherein A is optionally substituted quinolinyl.

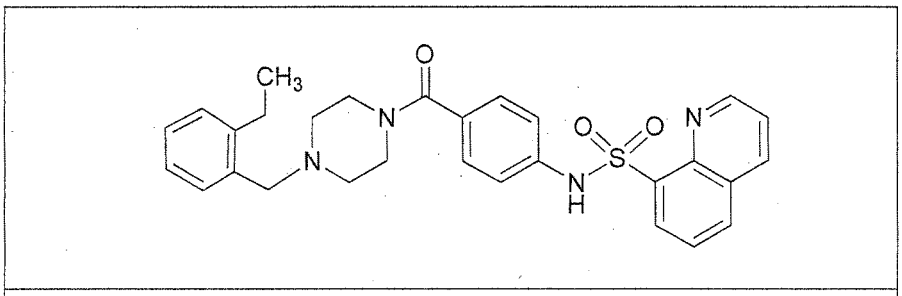
25. The use of claim 23, wherein A is .

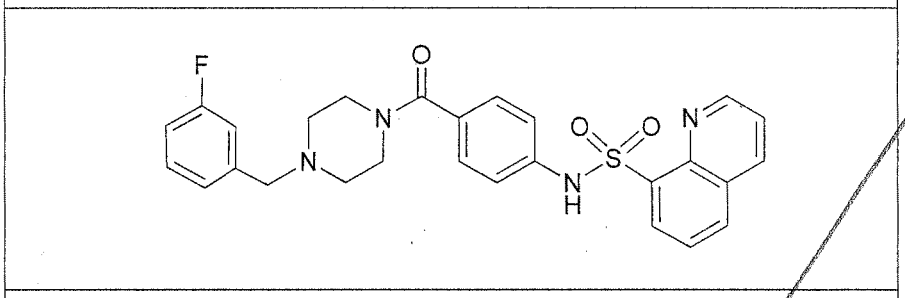
26. The use of any one of claims 1-7, wherein the compound is selected from:

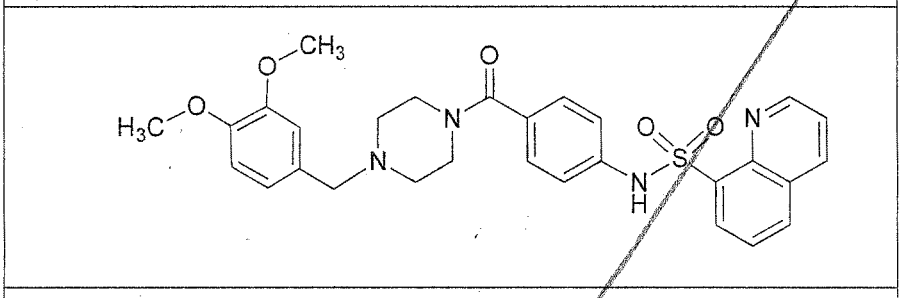


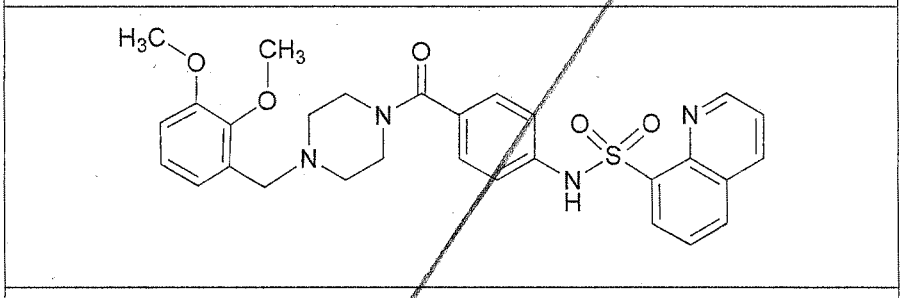


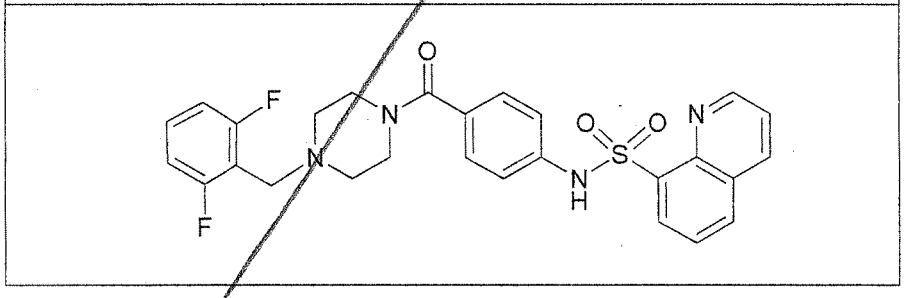


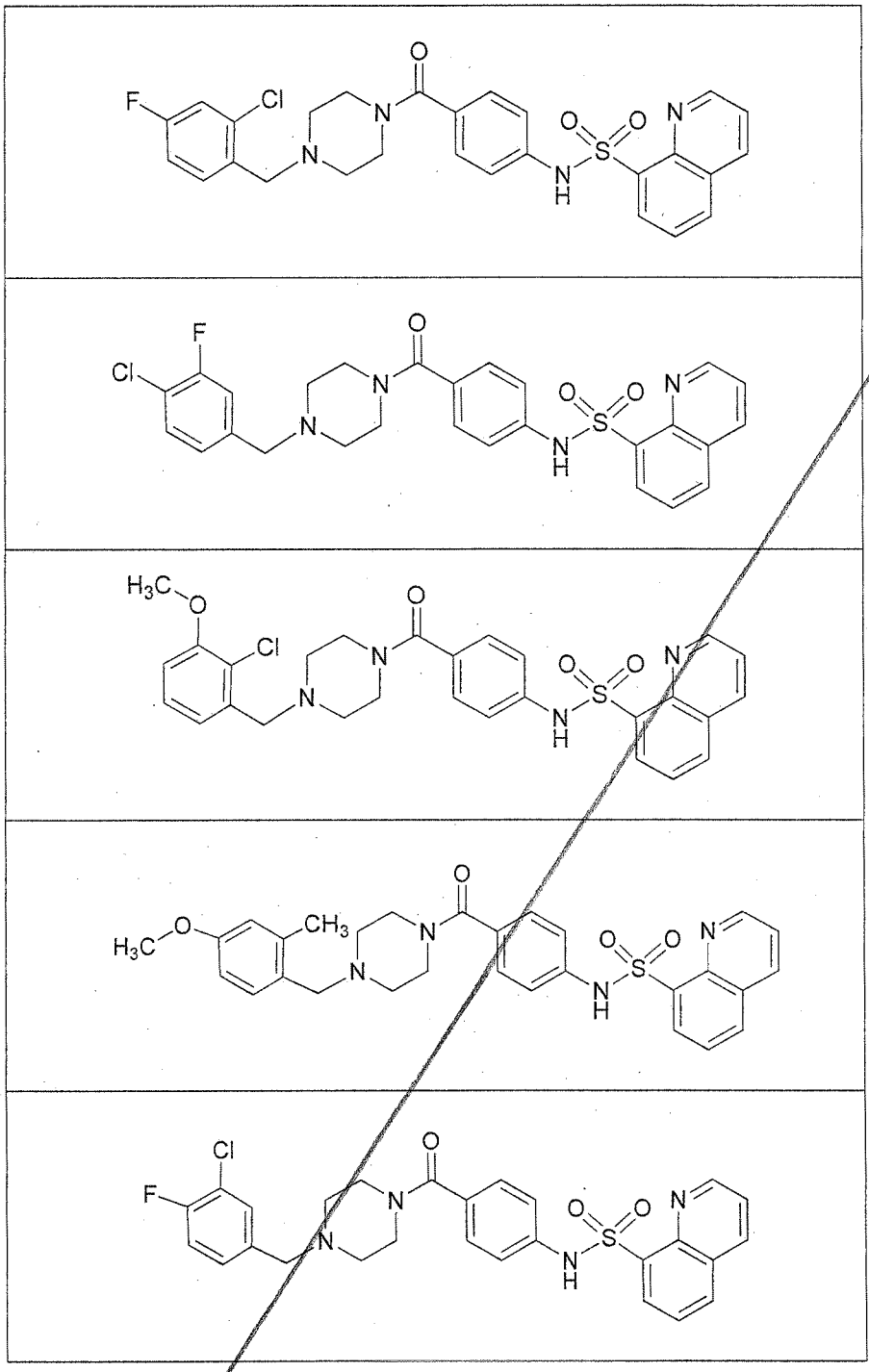


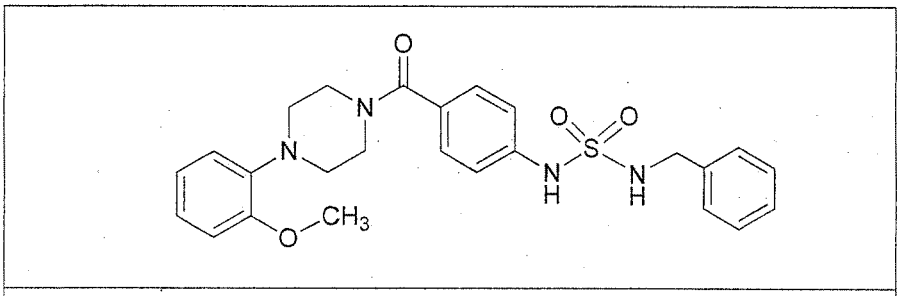


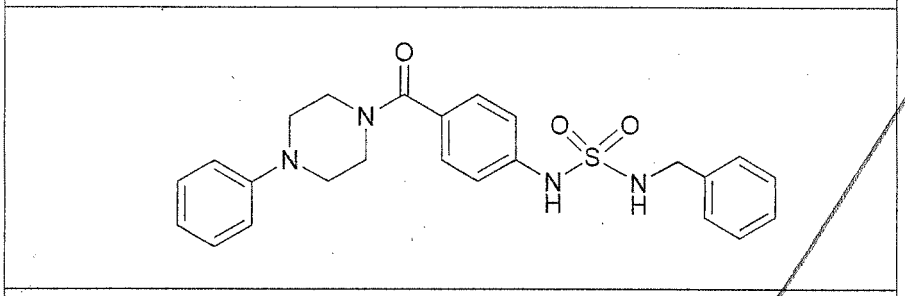


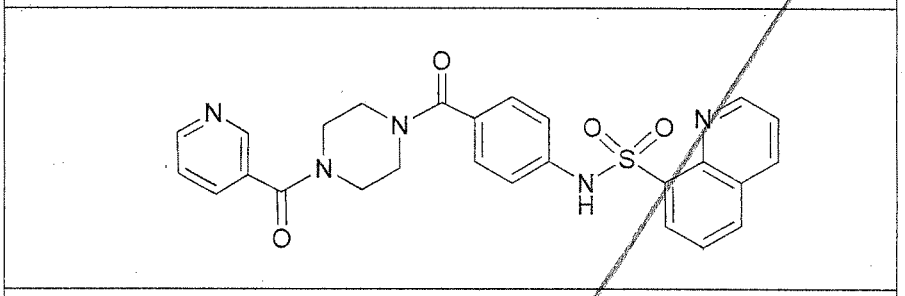


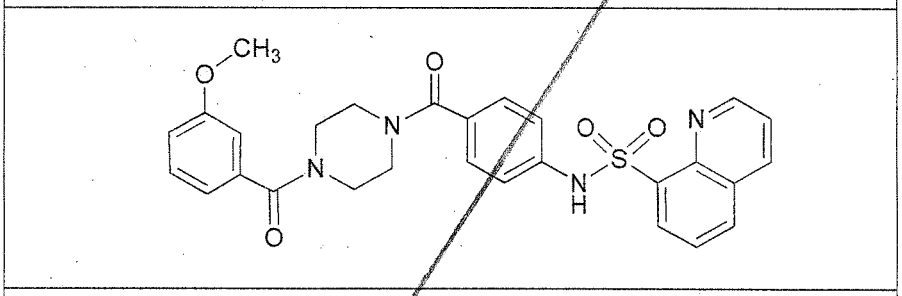


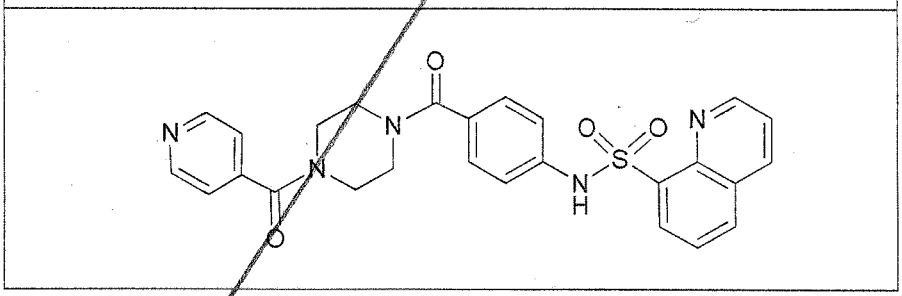


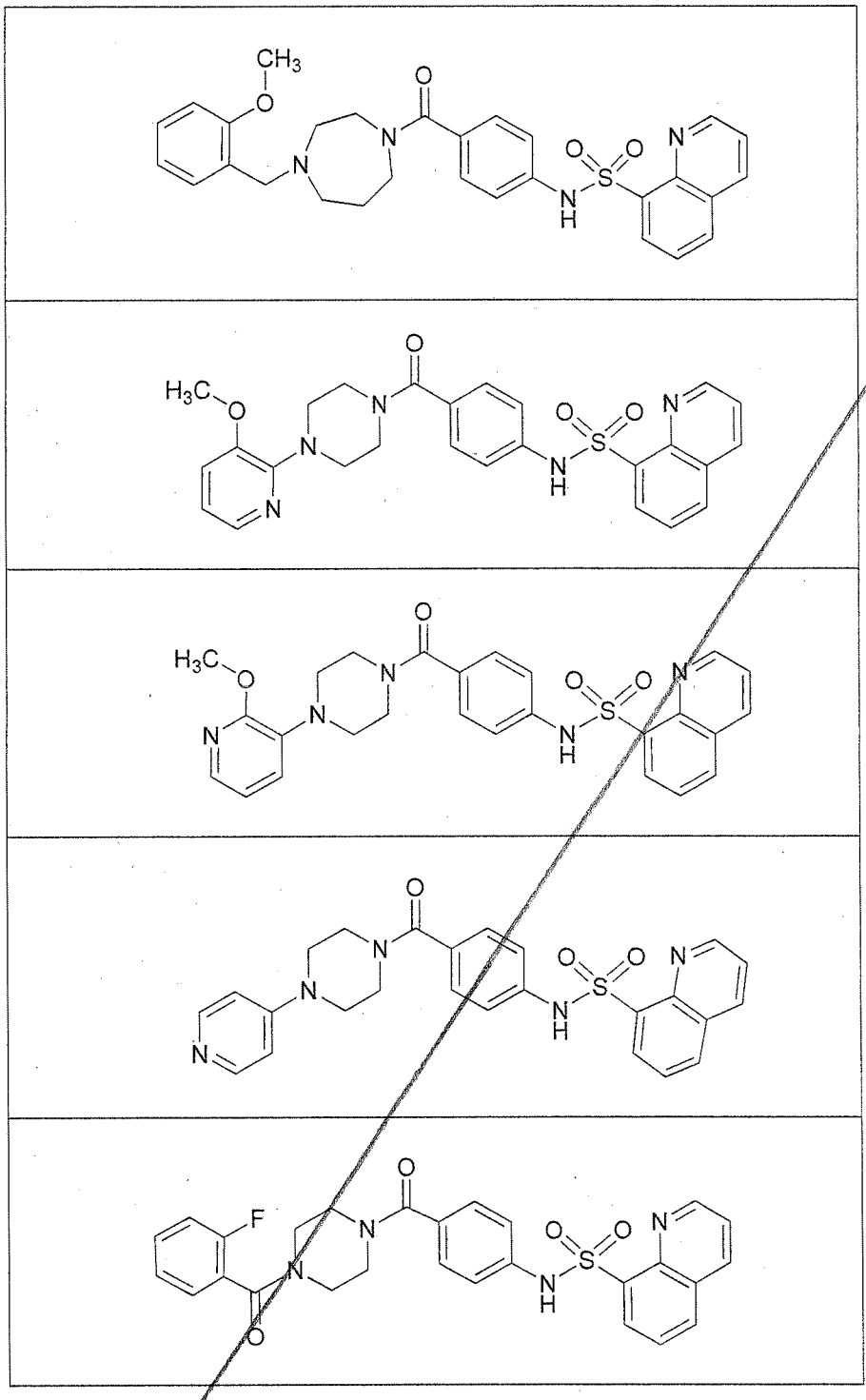


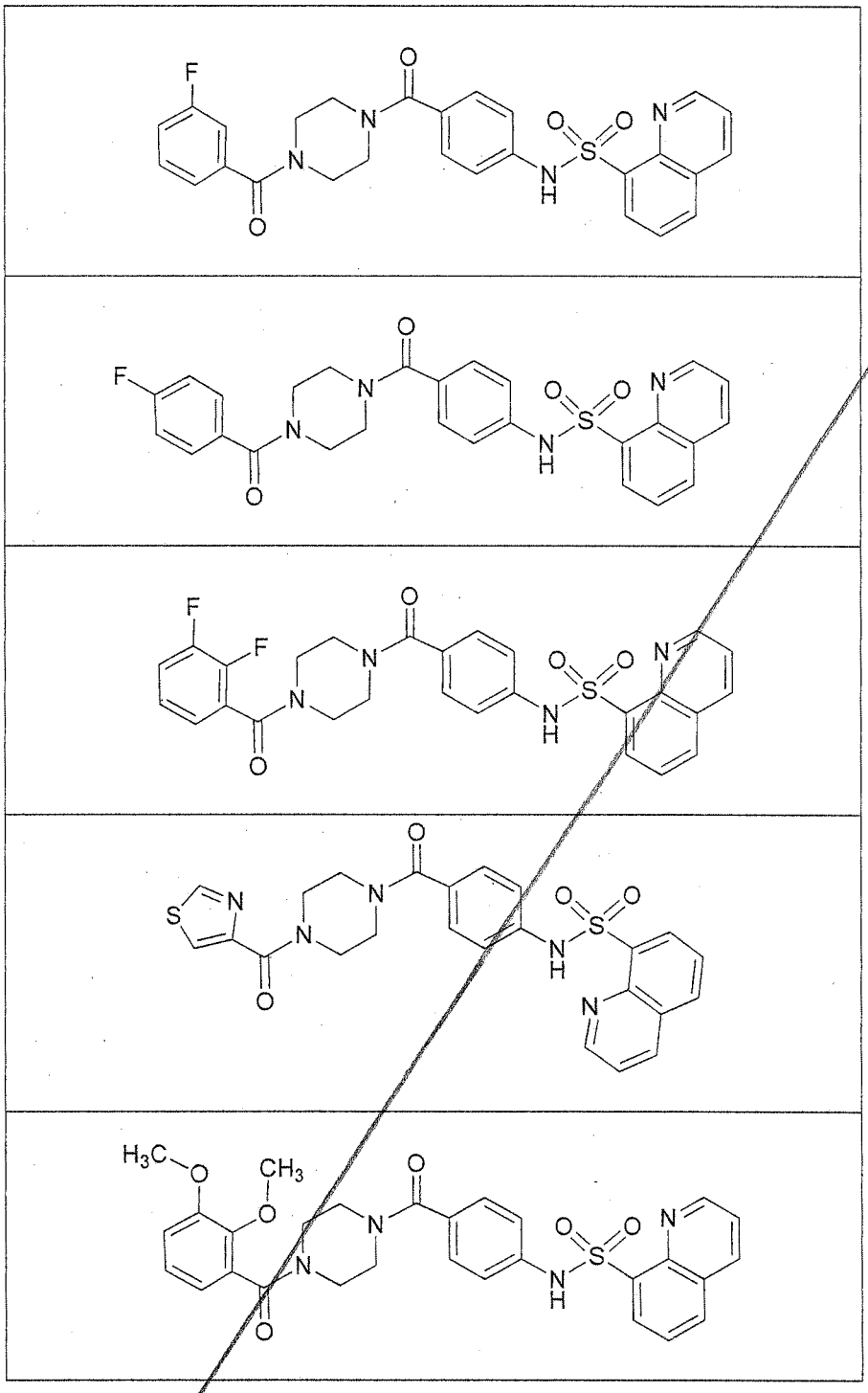


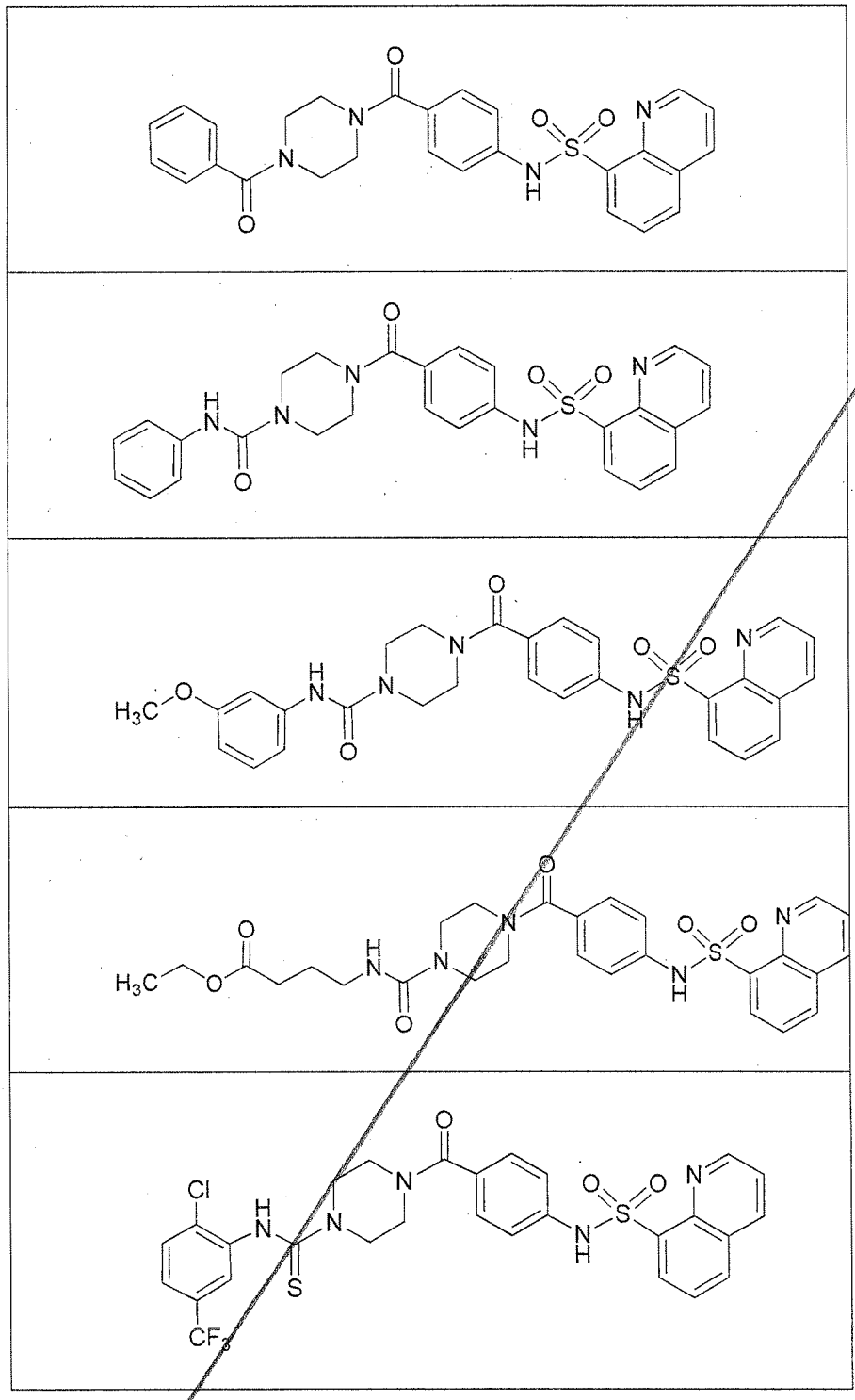


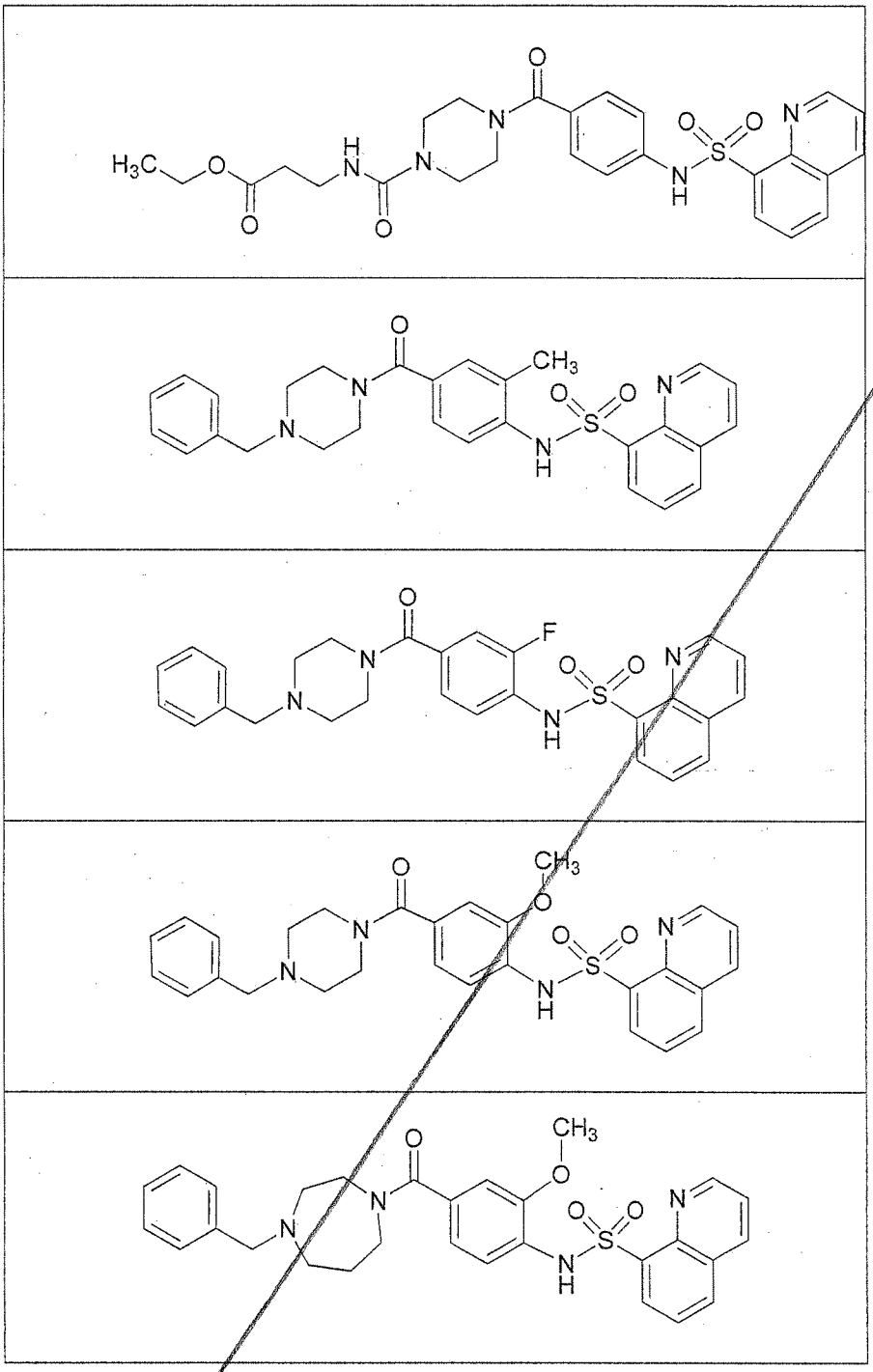


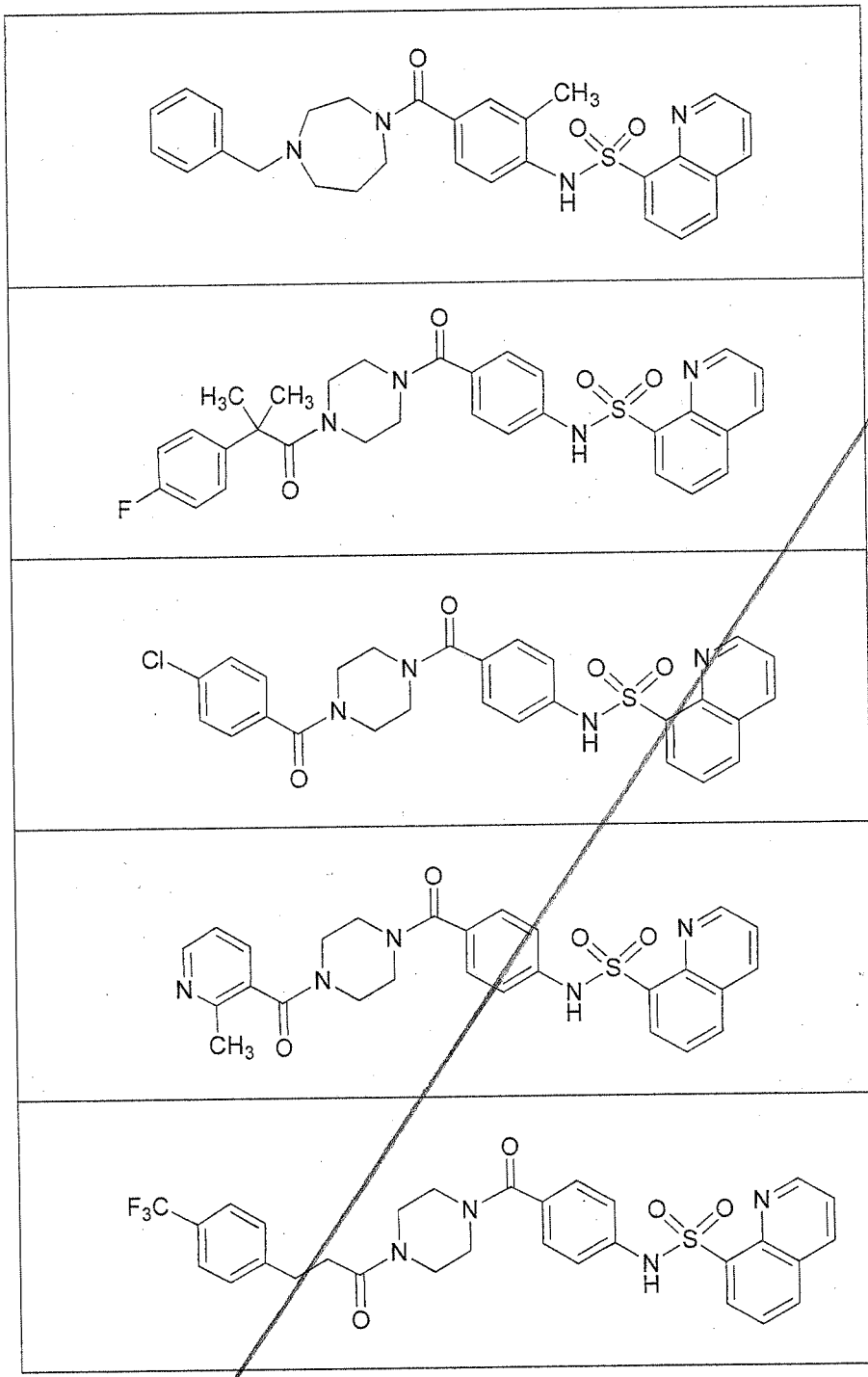


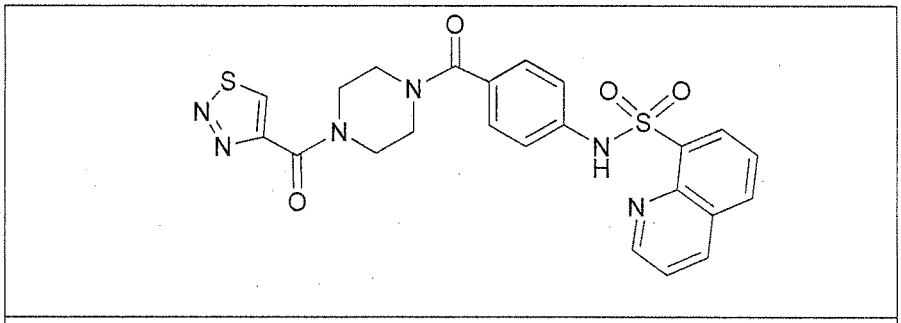


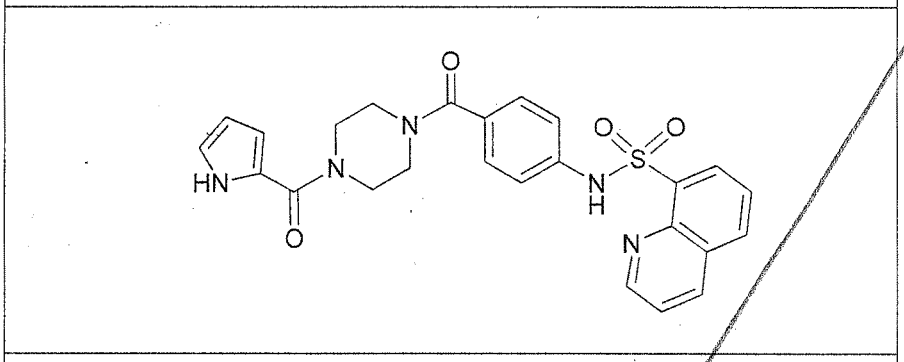


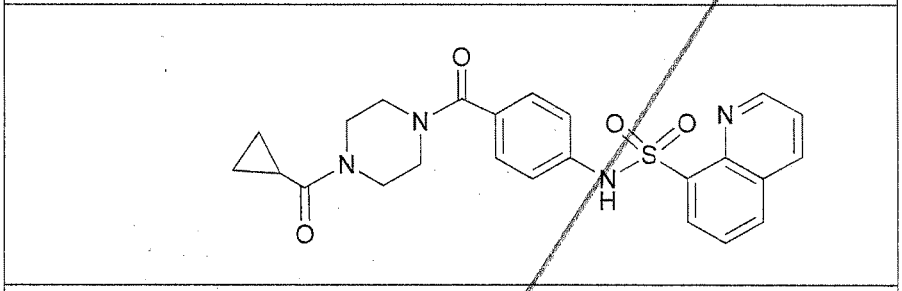


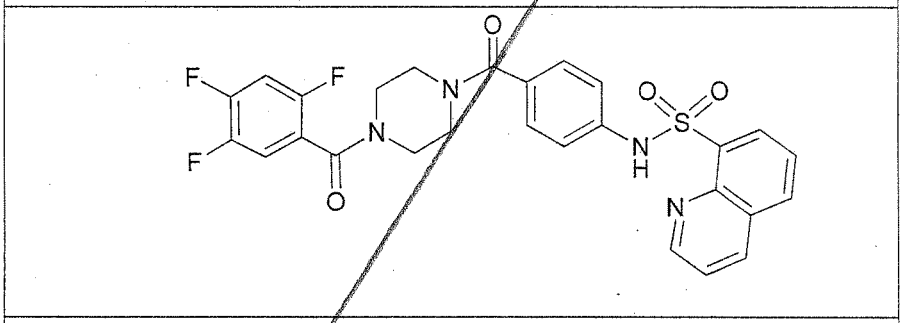


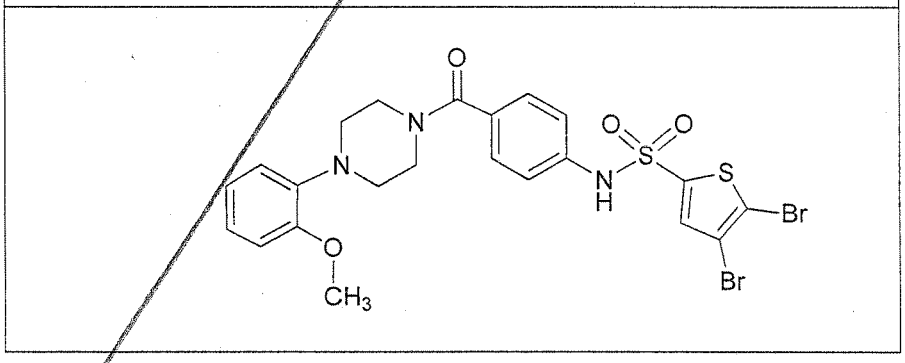


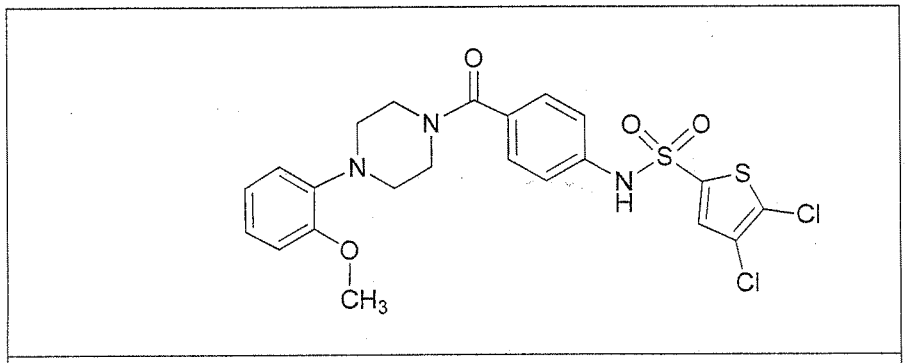


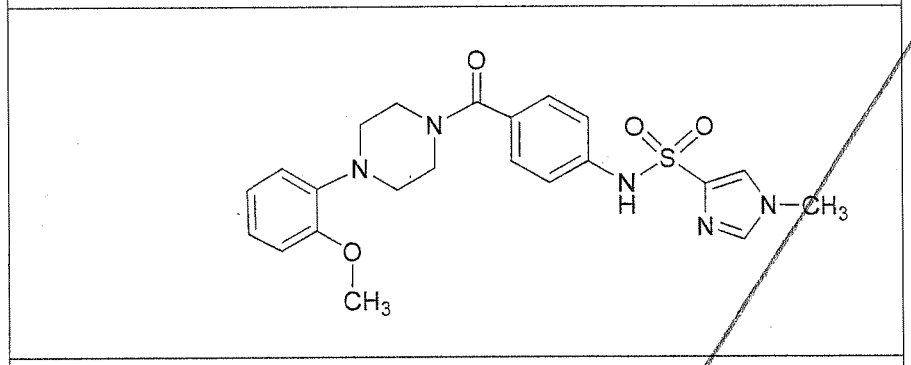


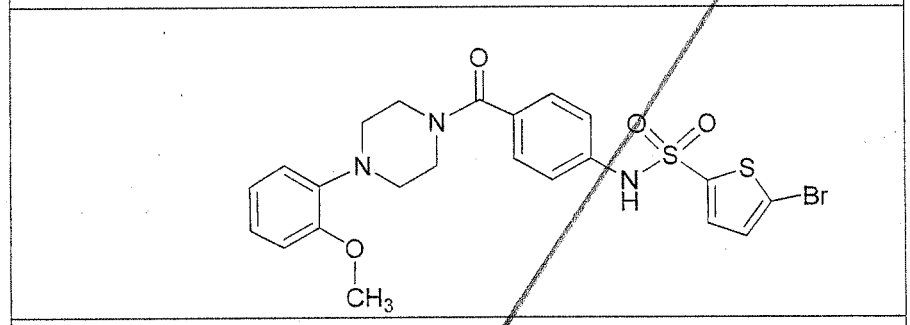


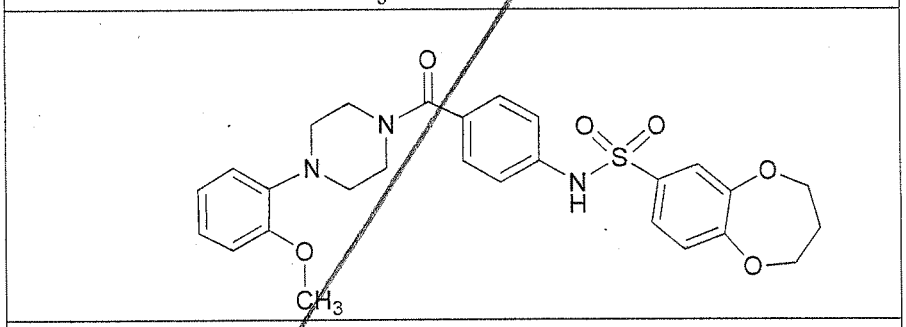


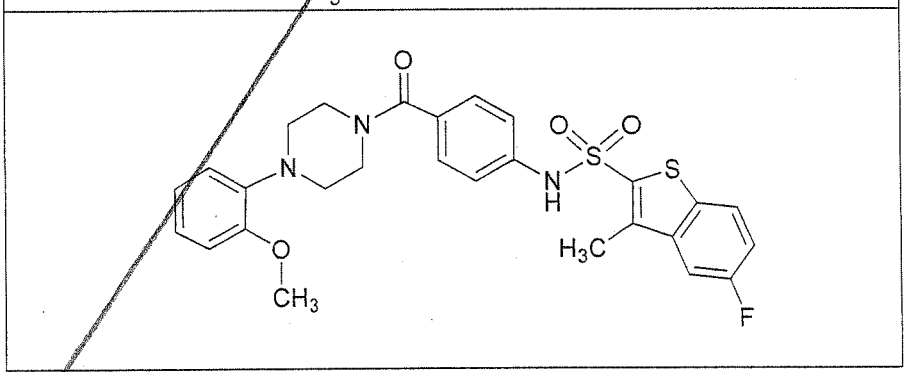


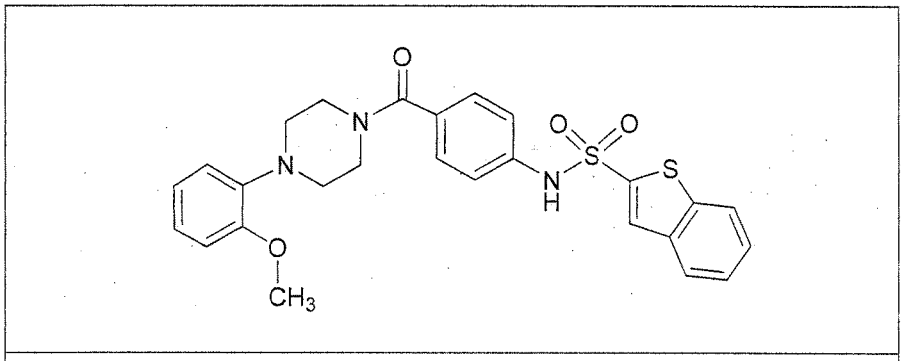


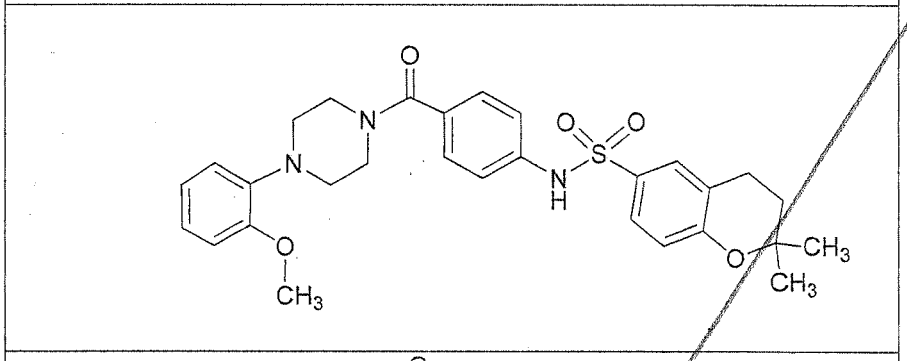


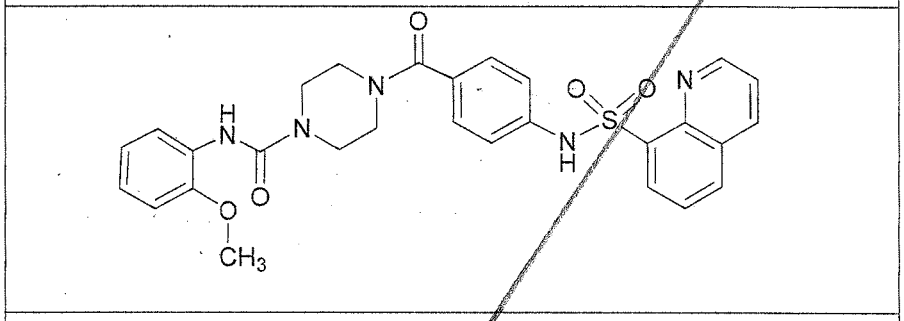


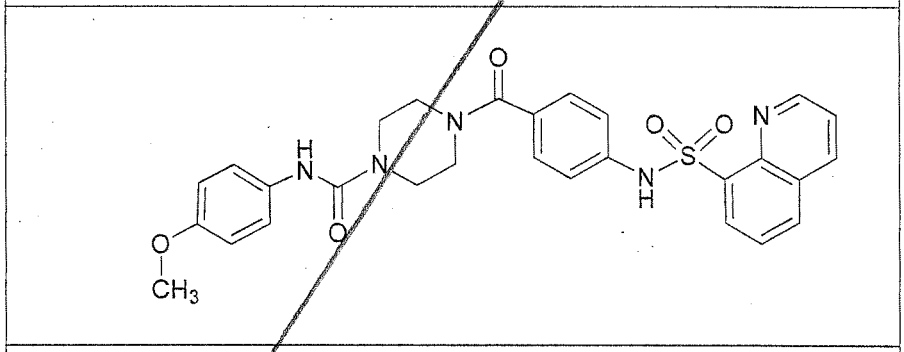


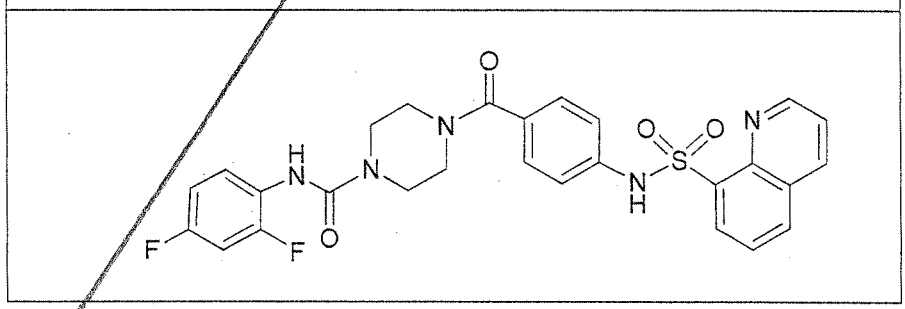


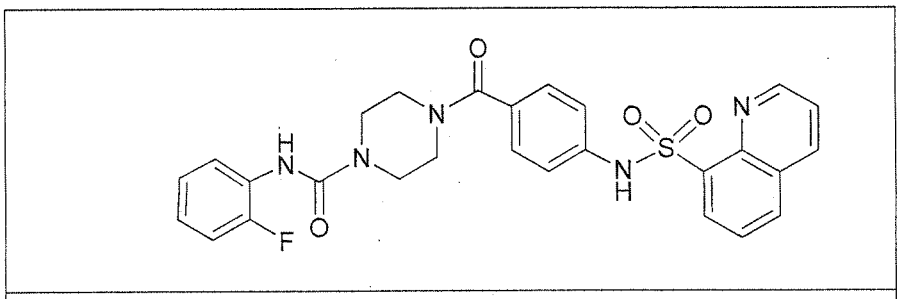


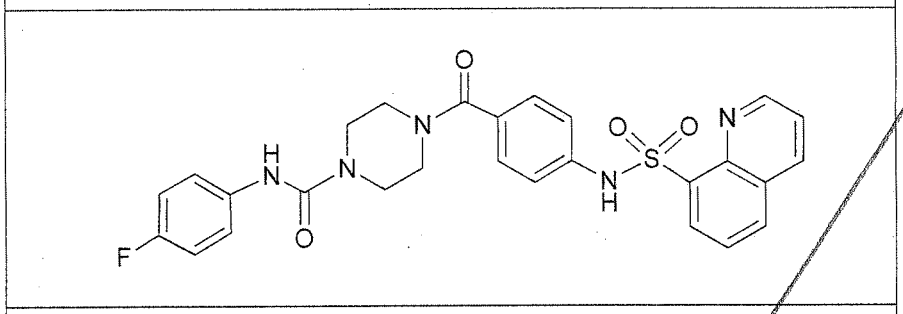


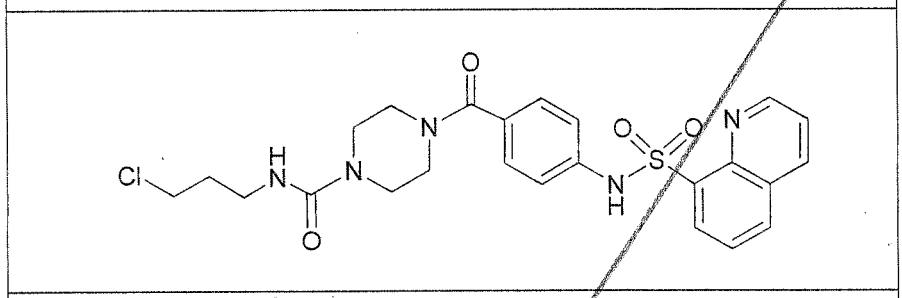


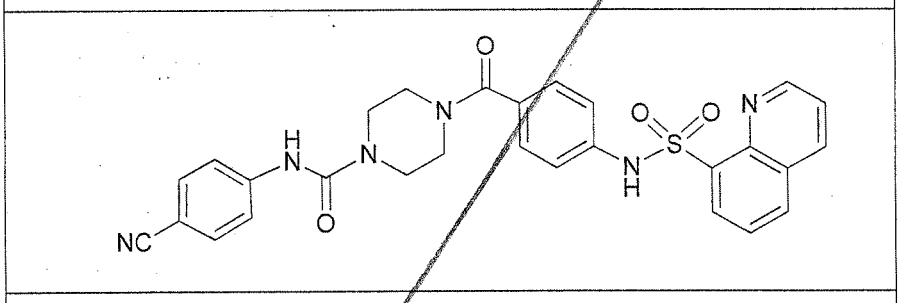


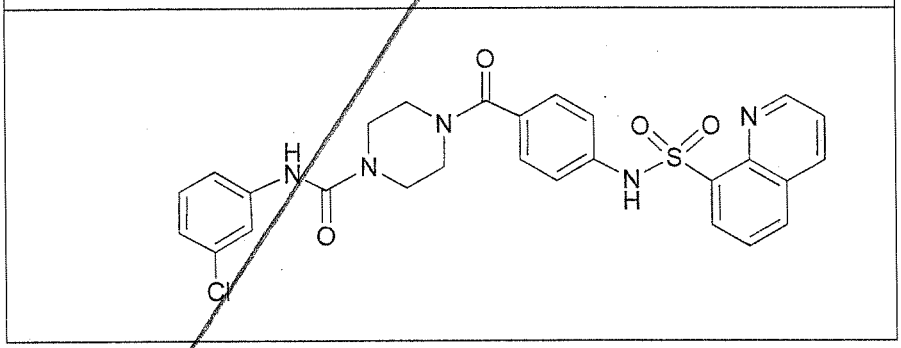


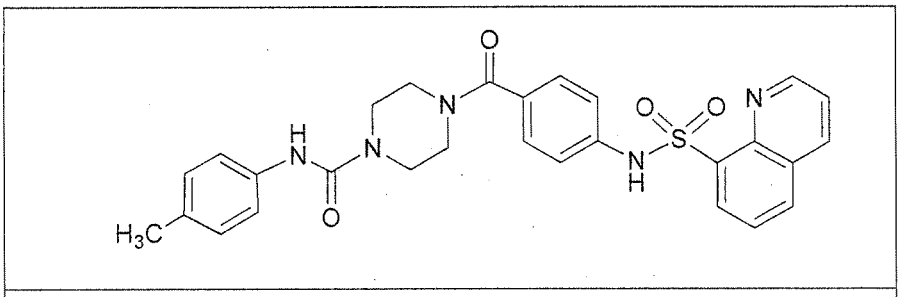


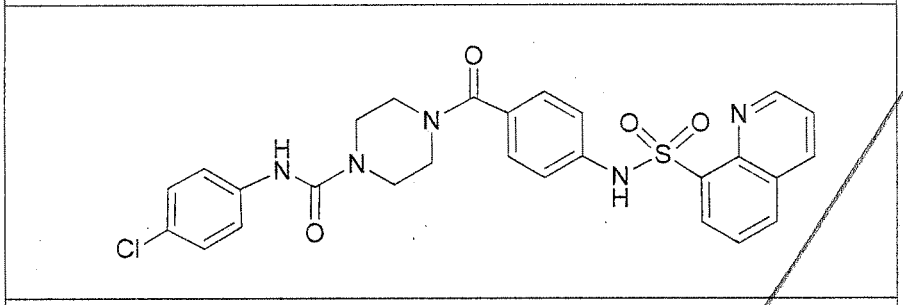


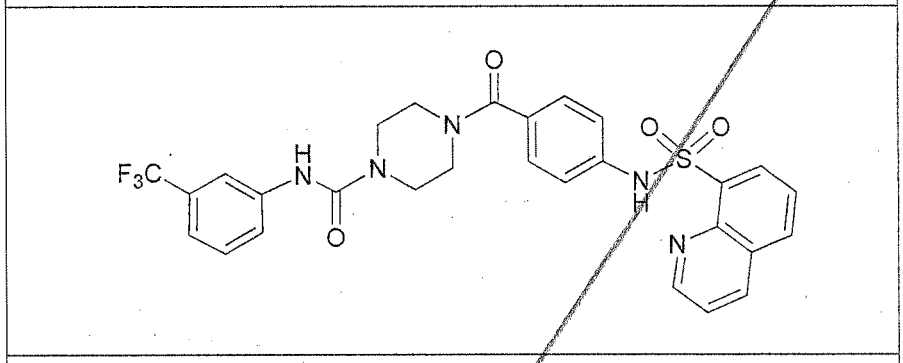


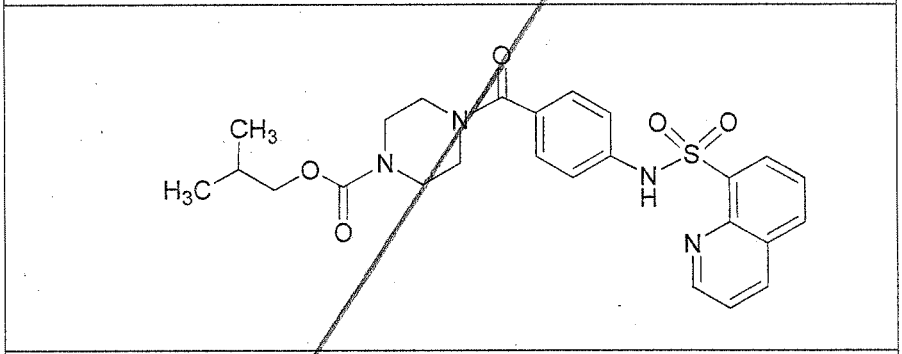


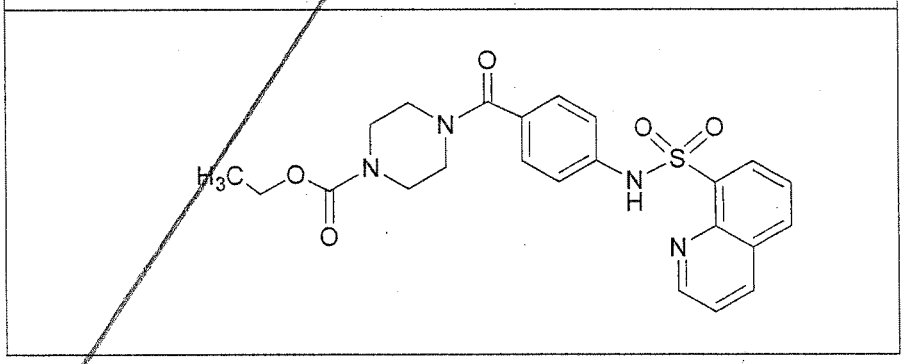


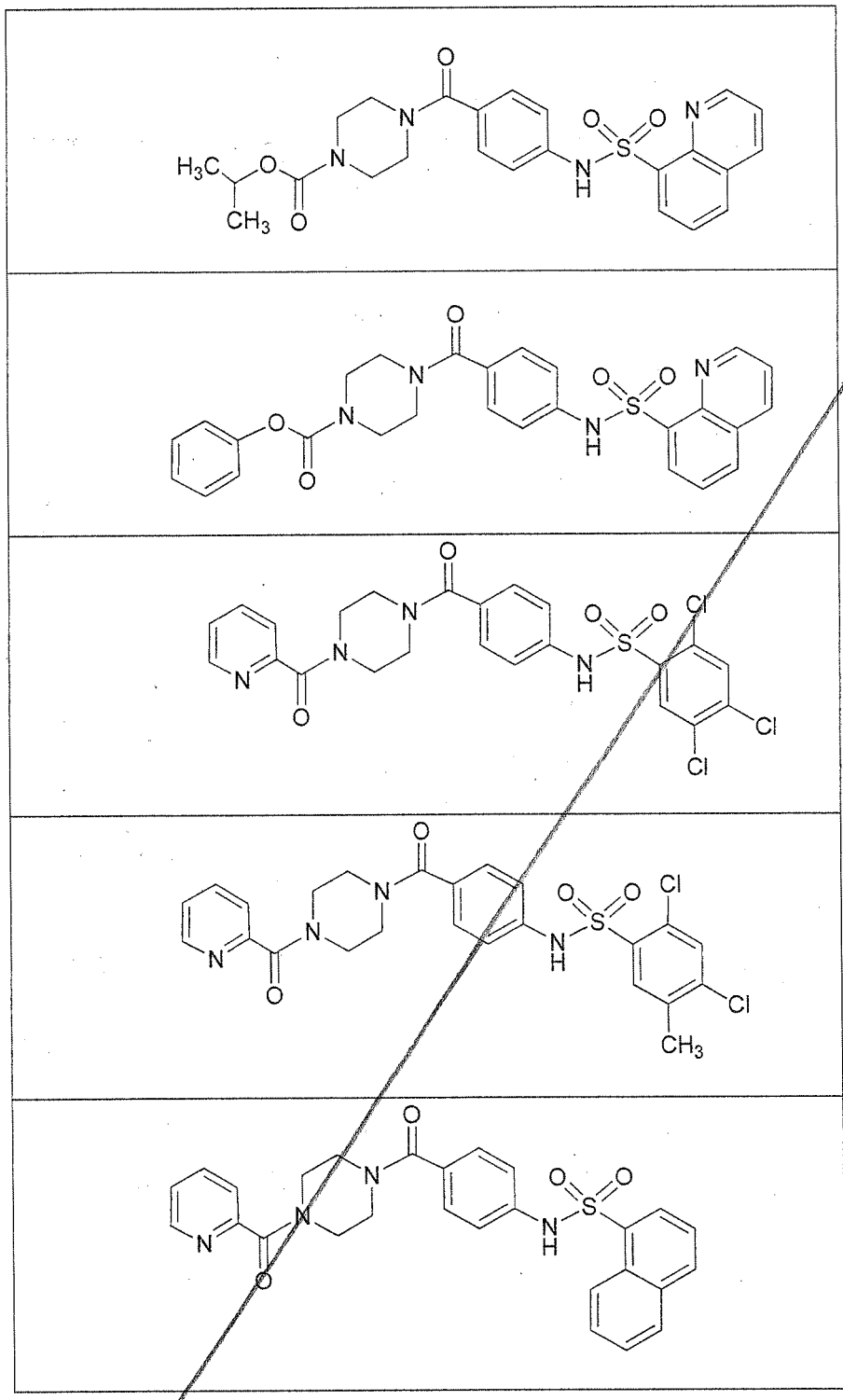


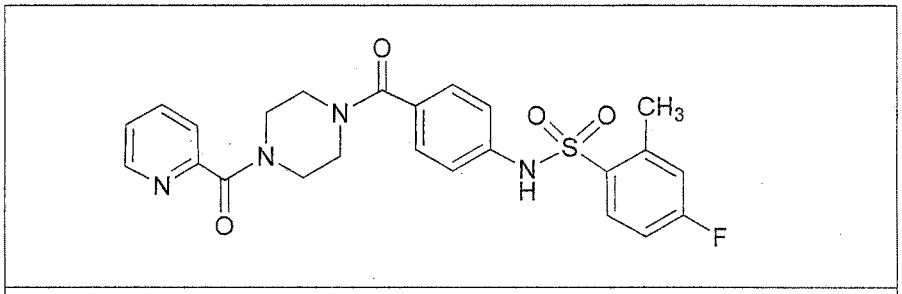


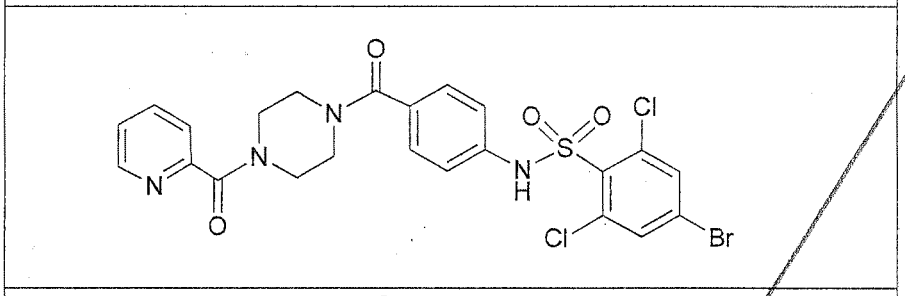


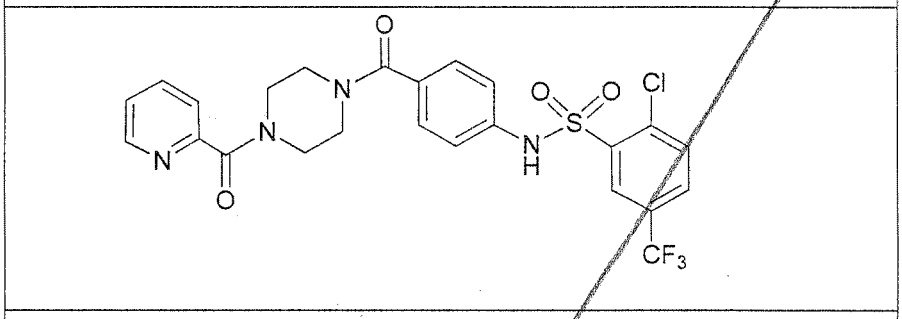


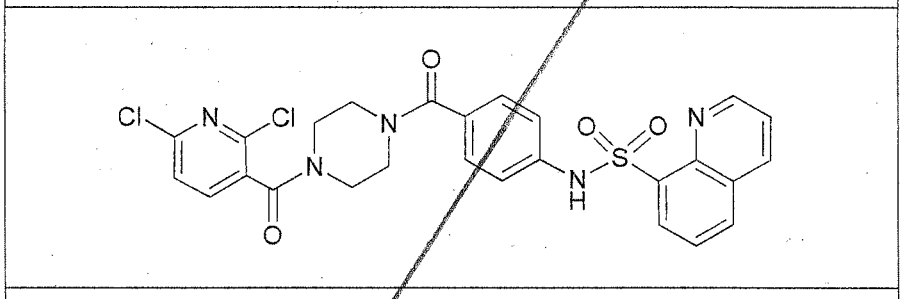


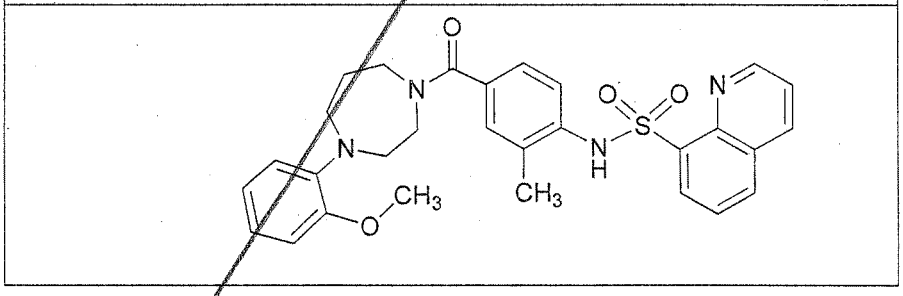


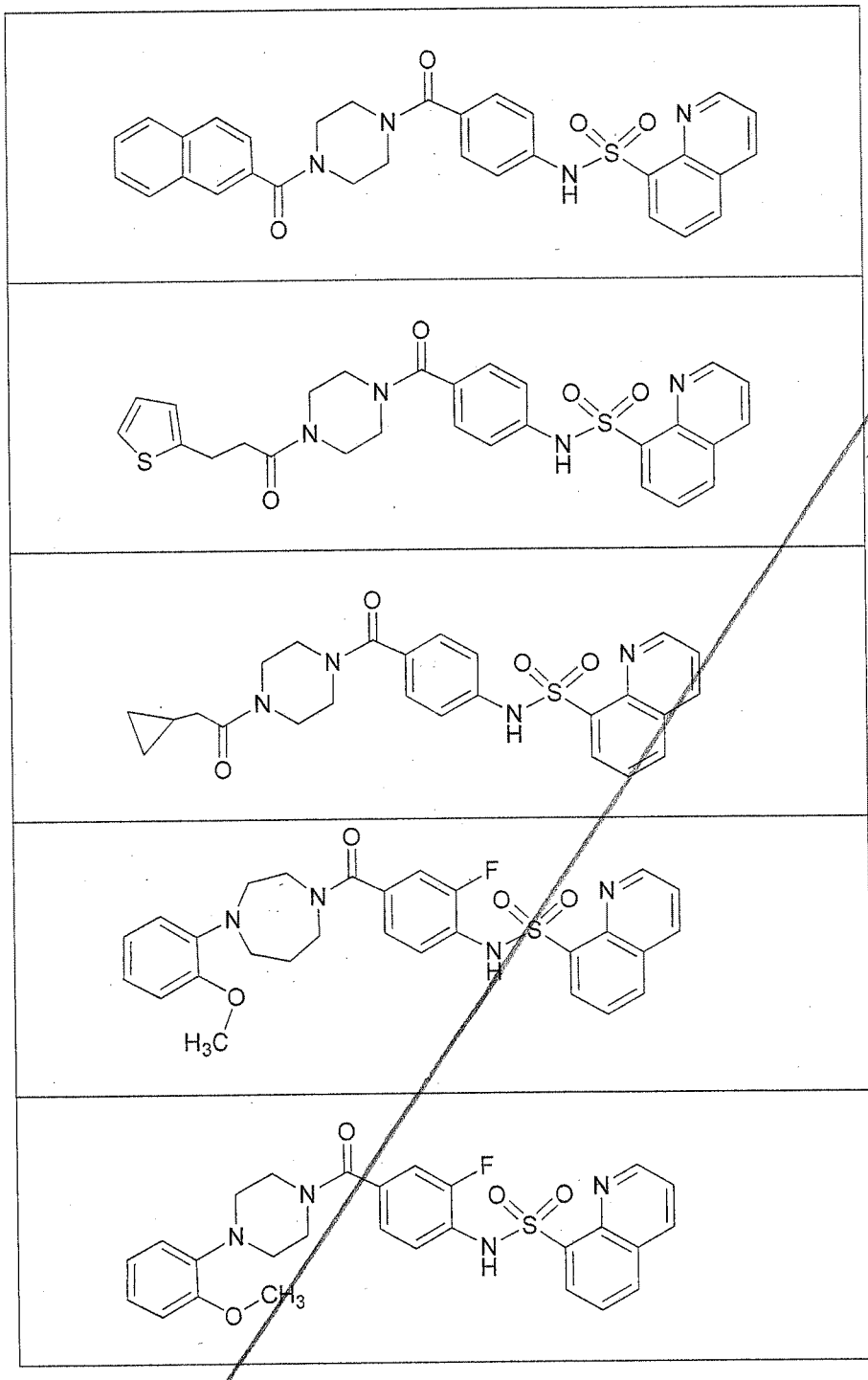


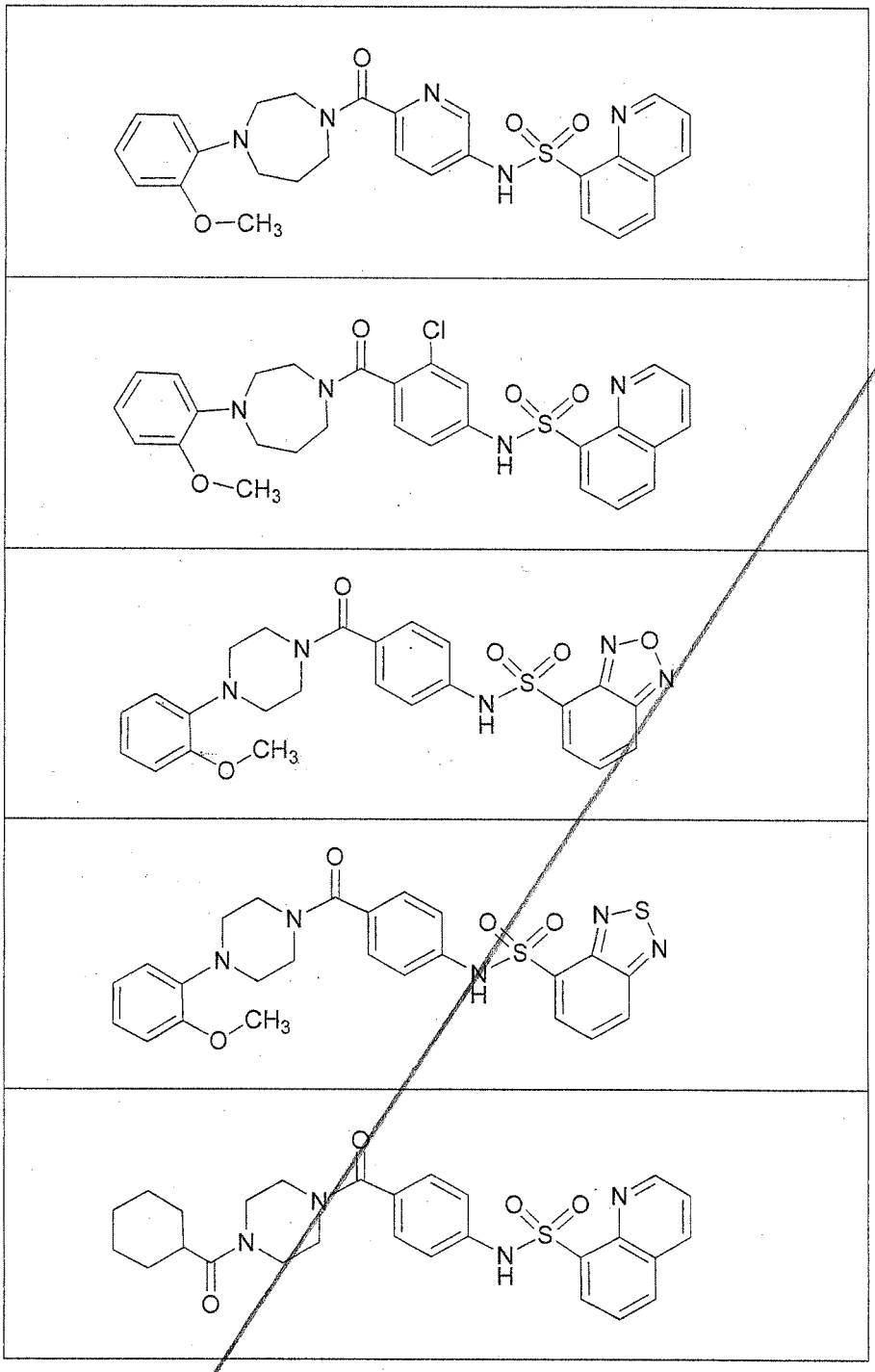


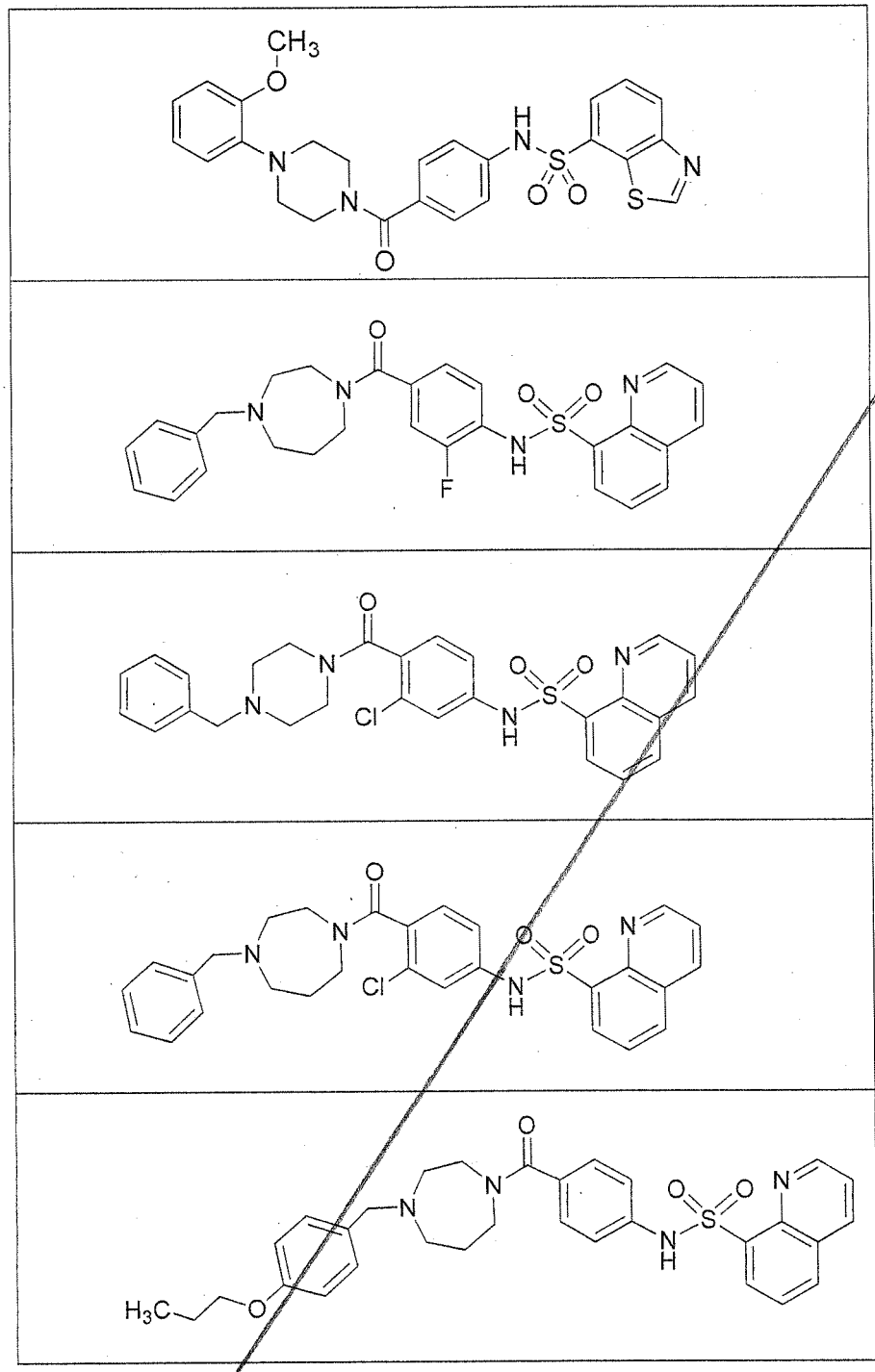


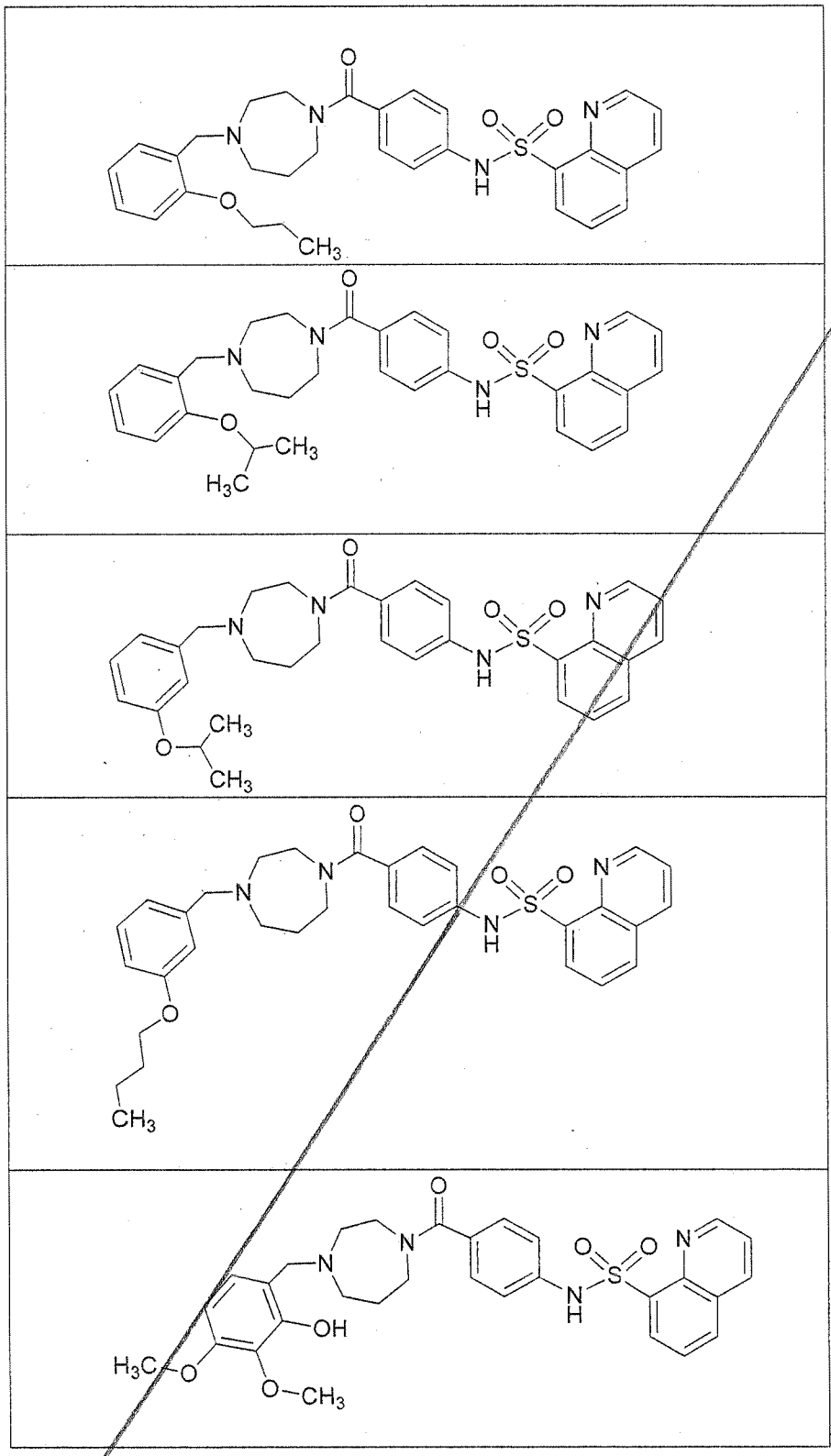


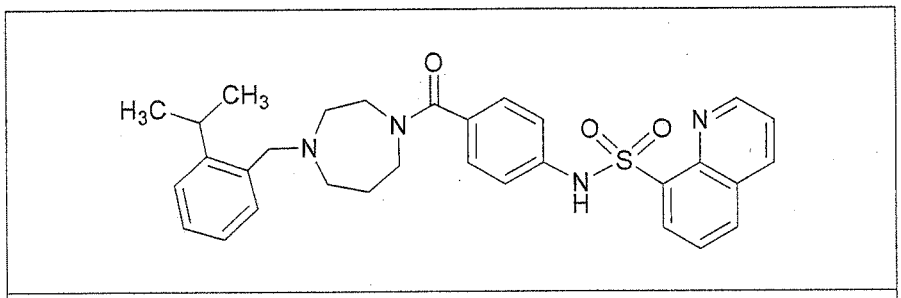


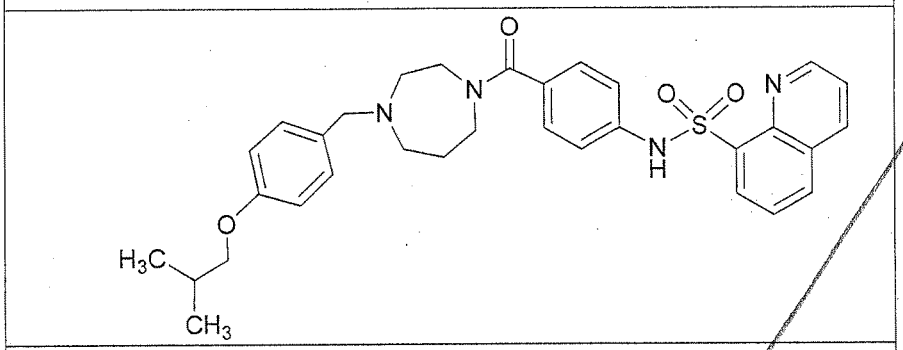


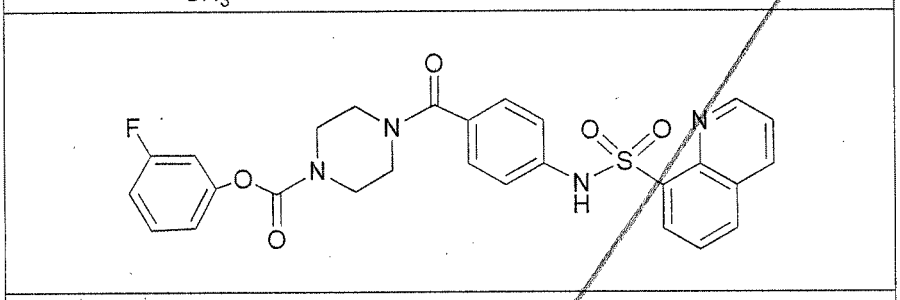


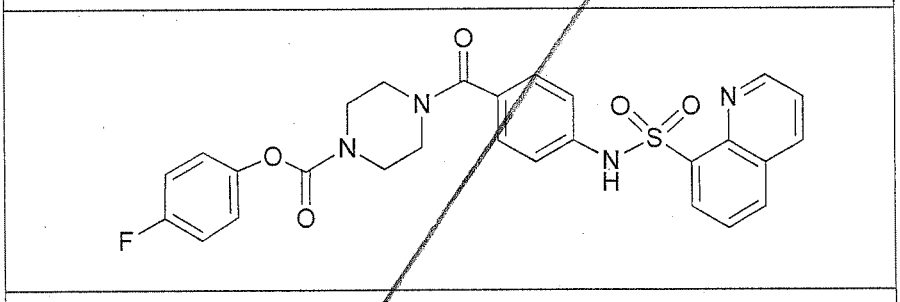


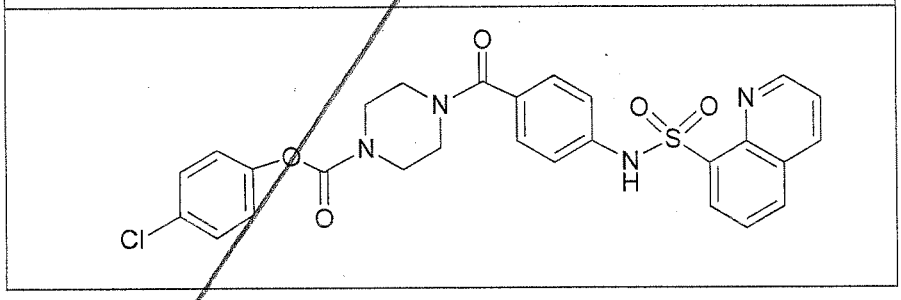


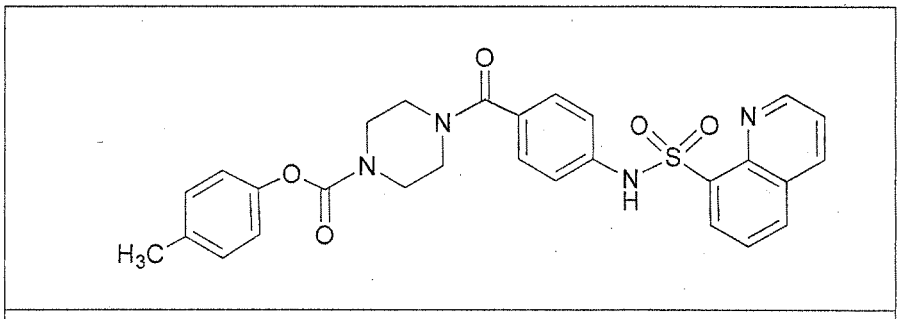


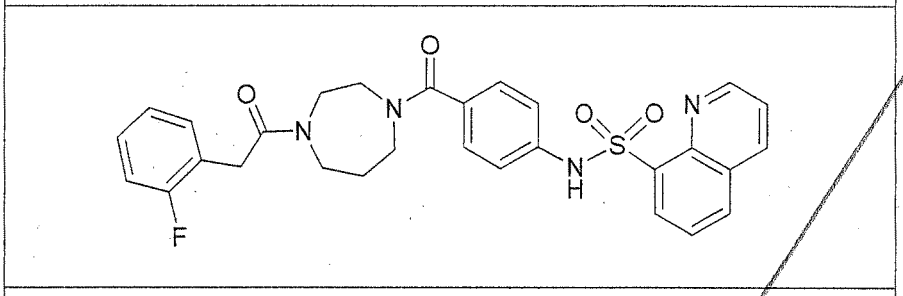


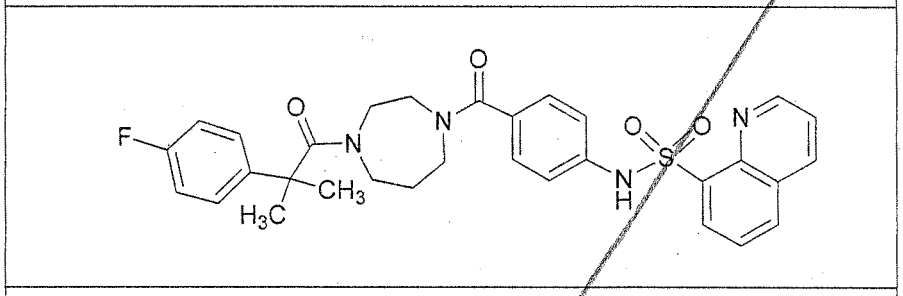


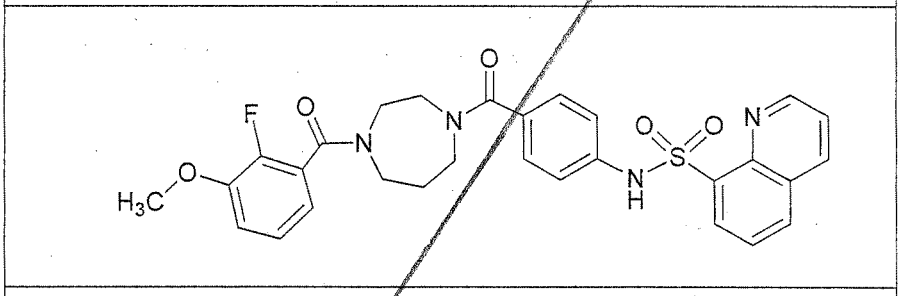


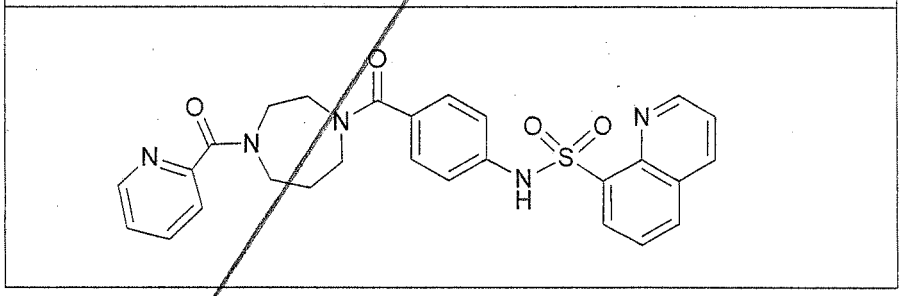


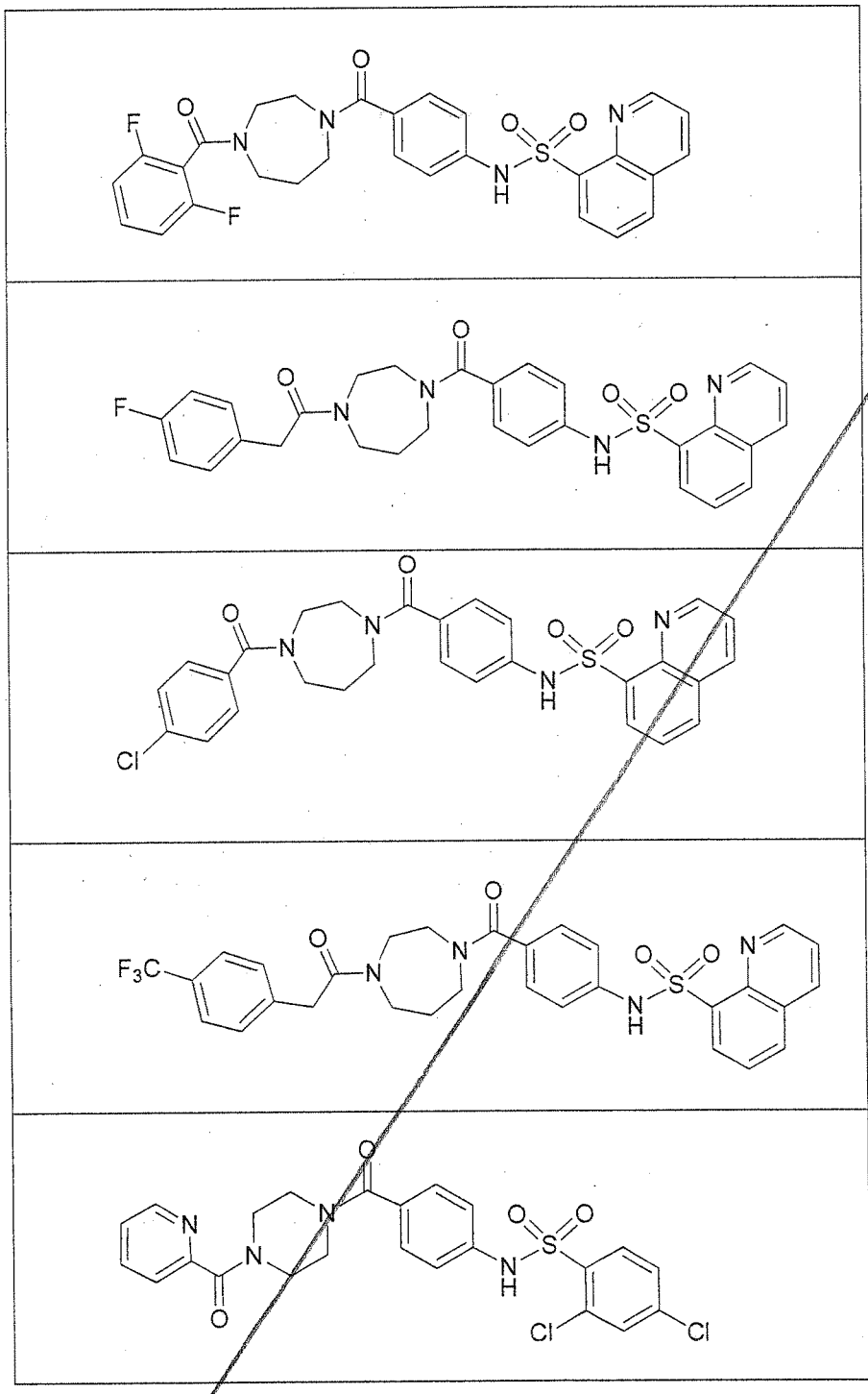


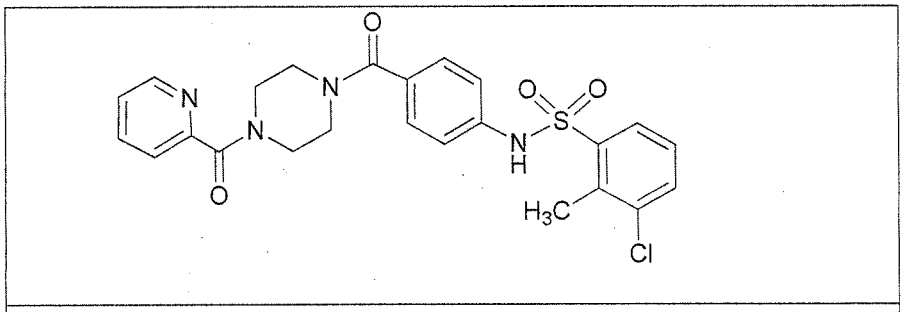


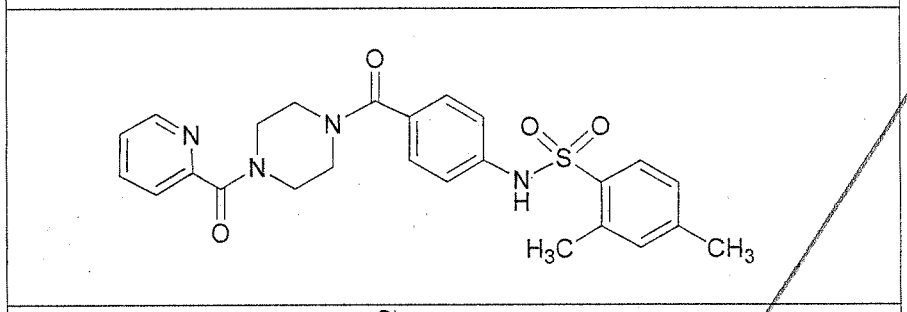


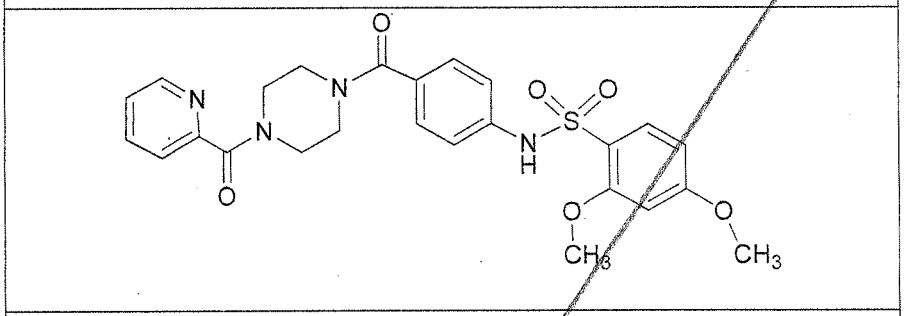


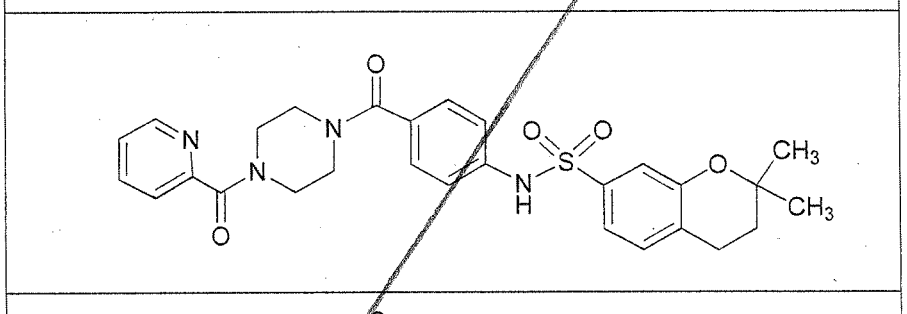


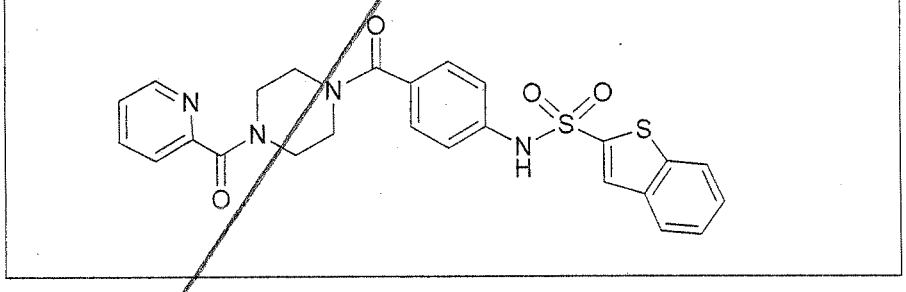


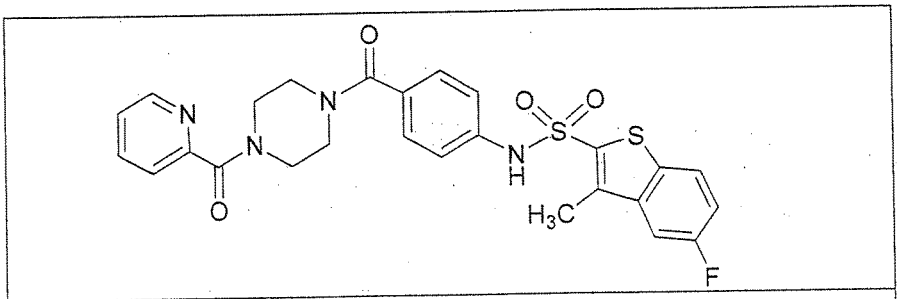


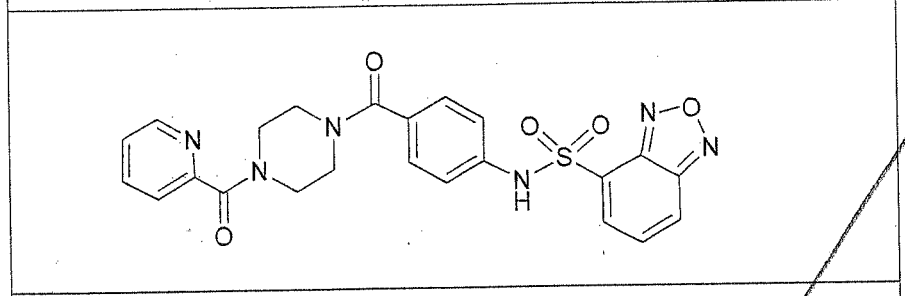


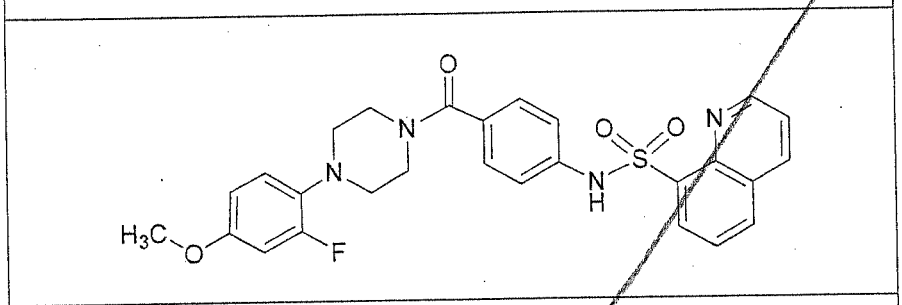


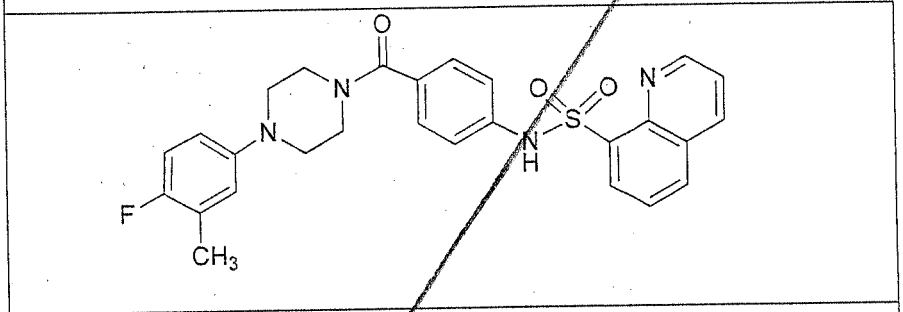


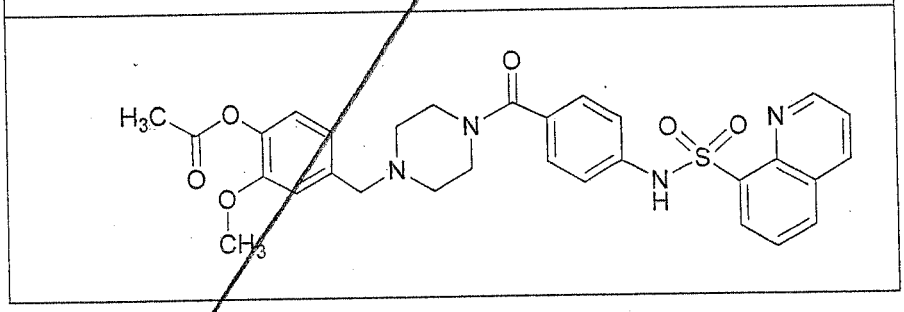


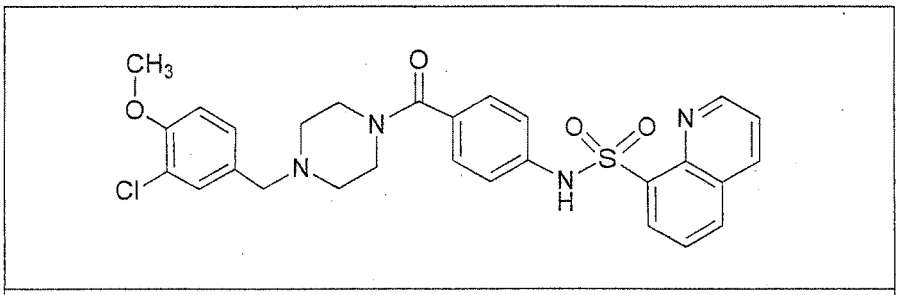


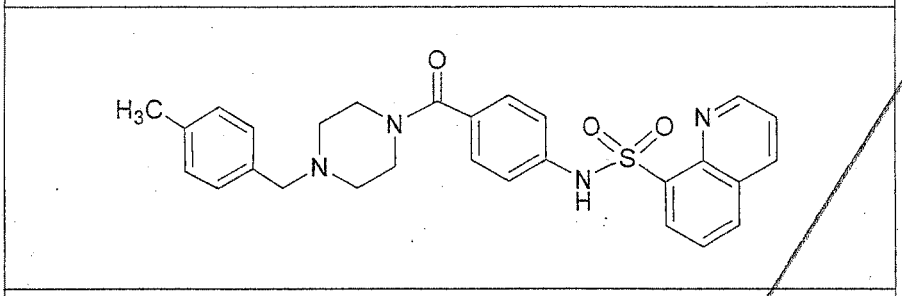


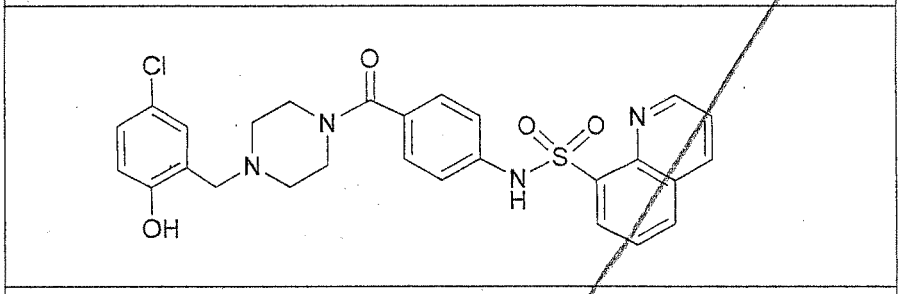


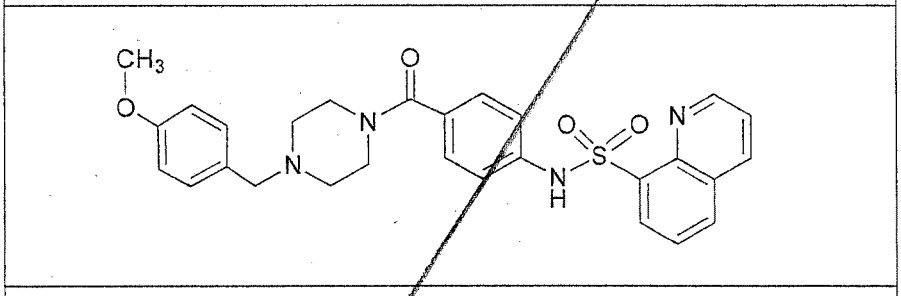


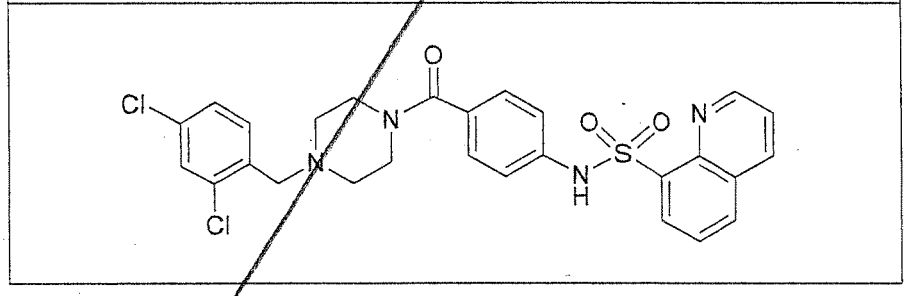


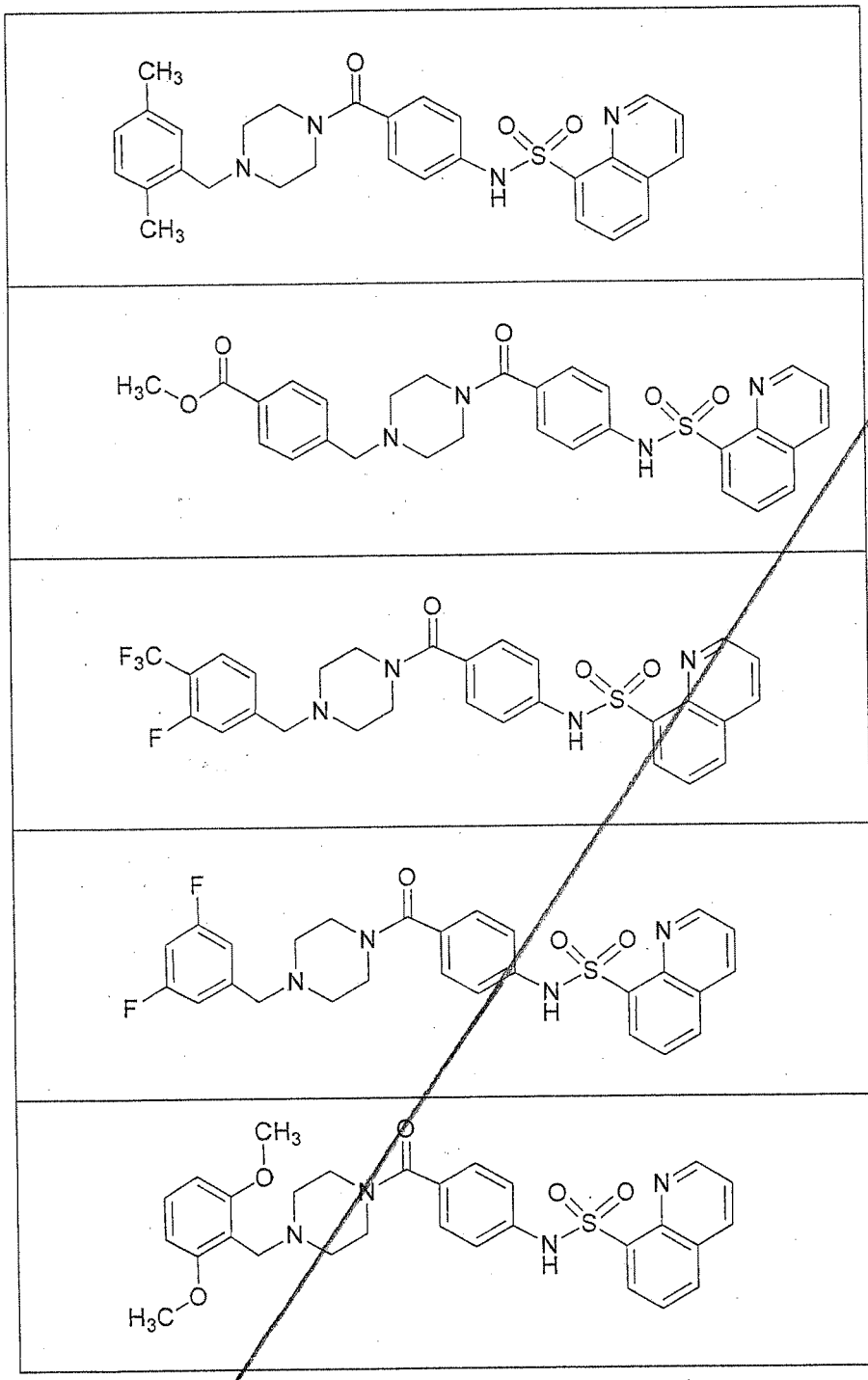


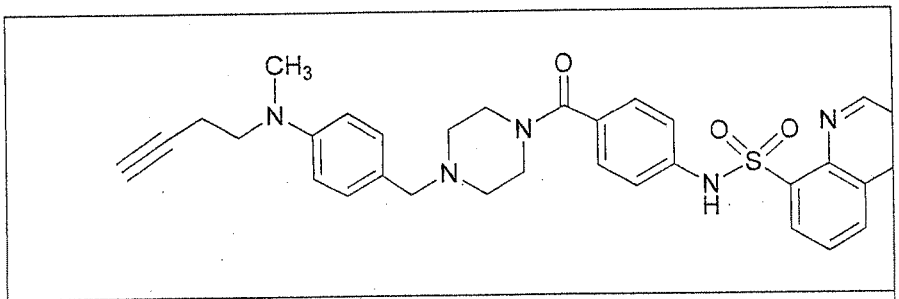


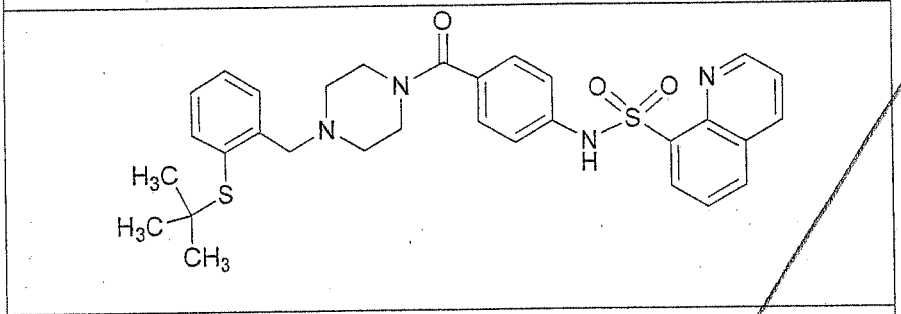


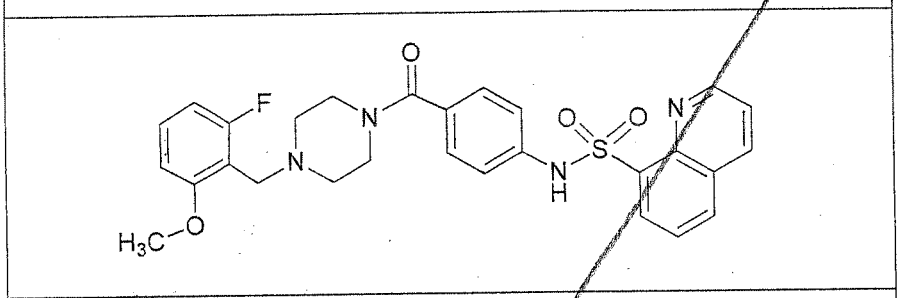


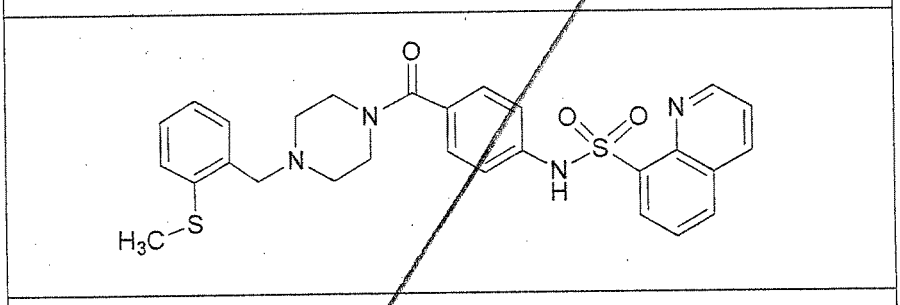


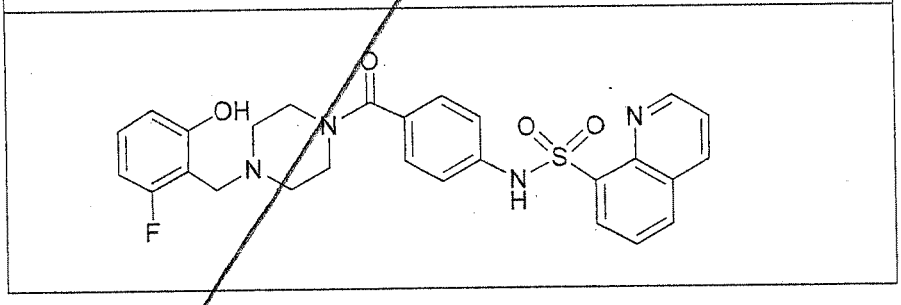


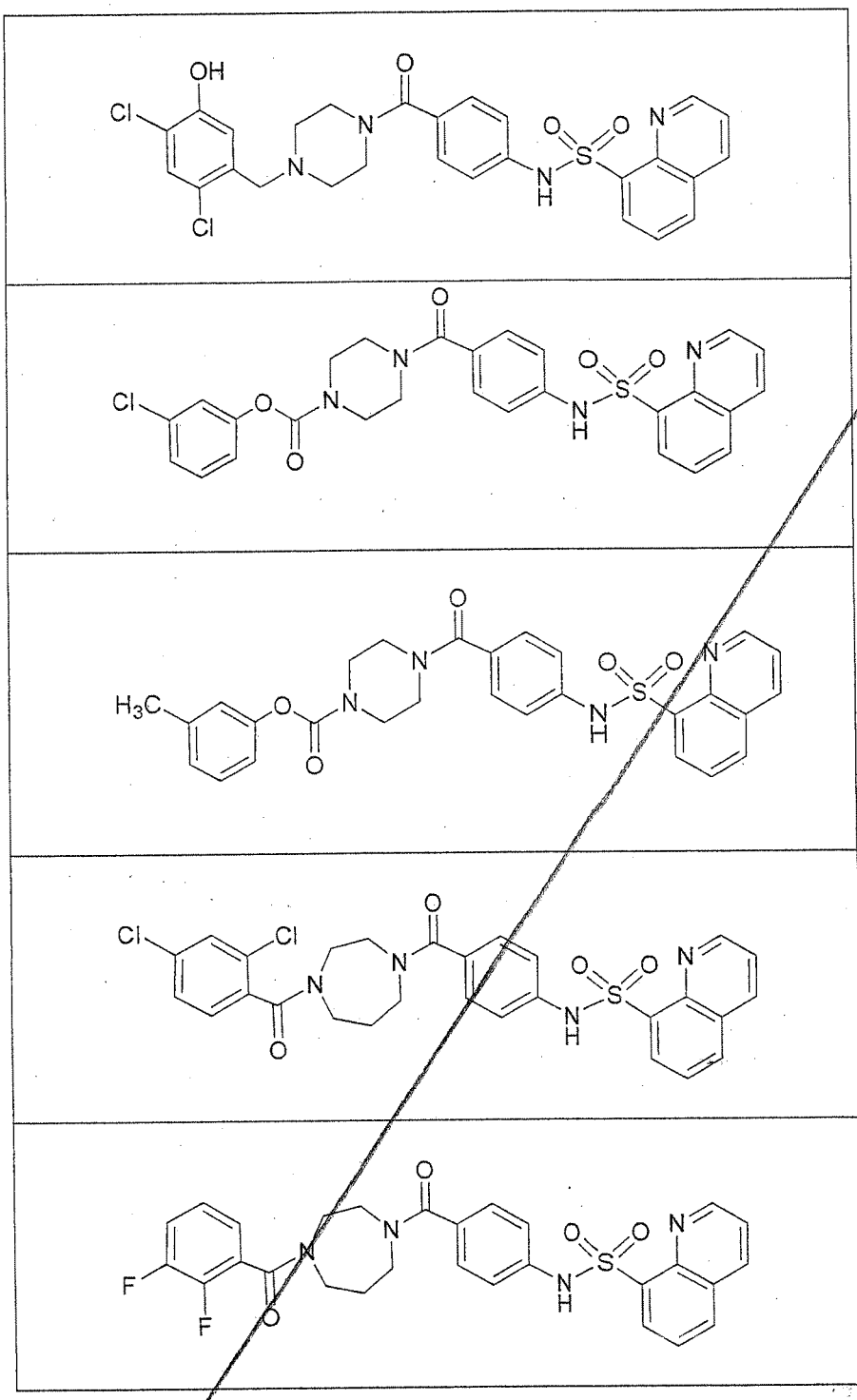


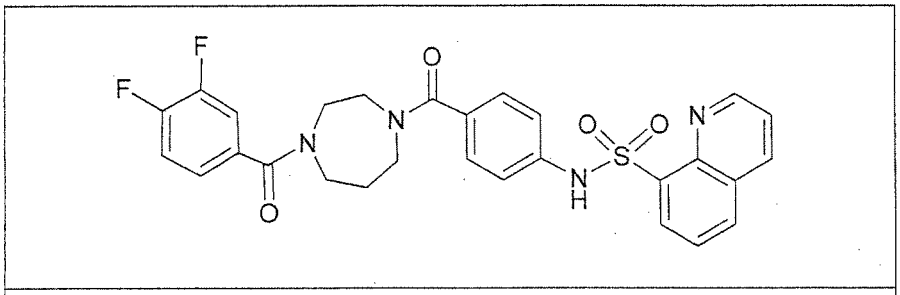


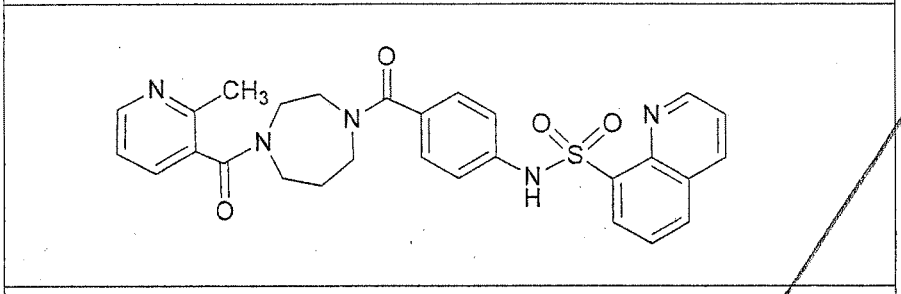


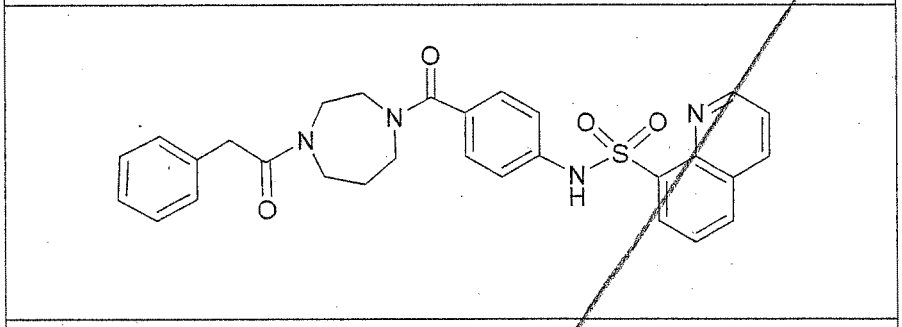


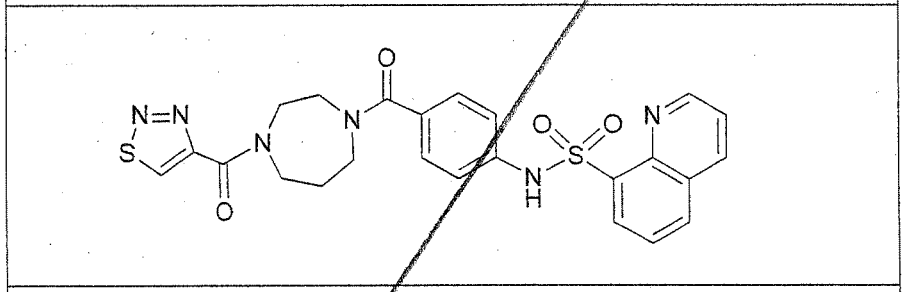


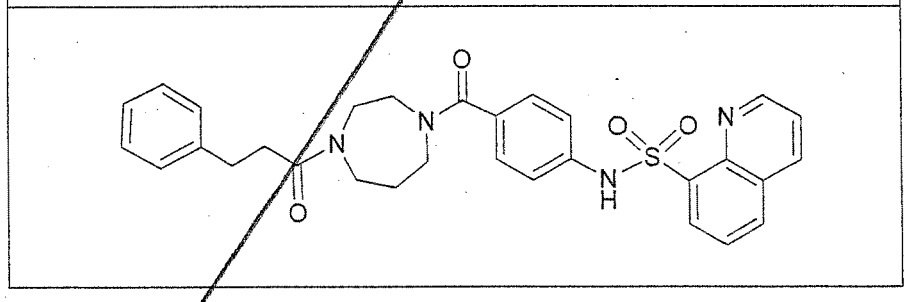


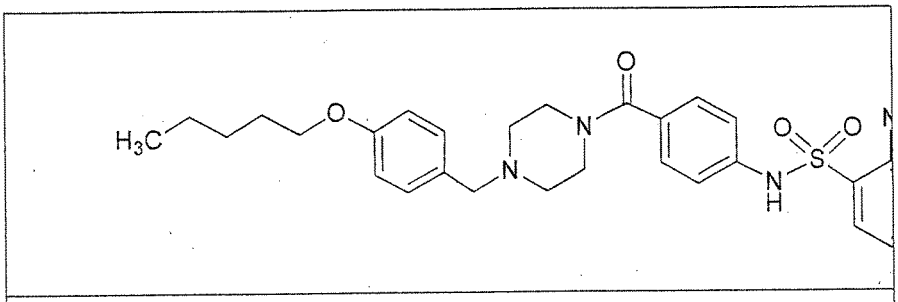


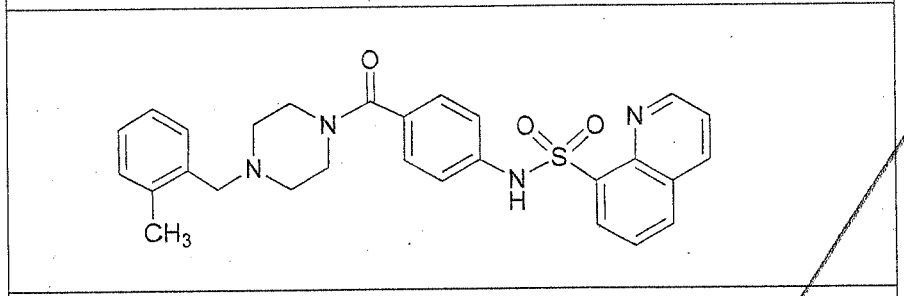


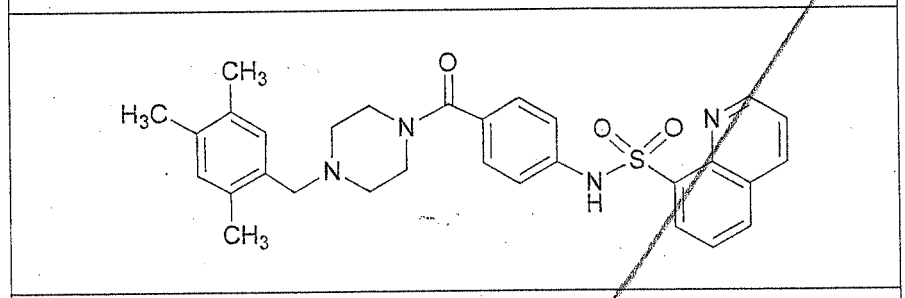


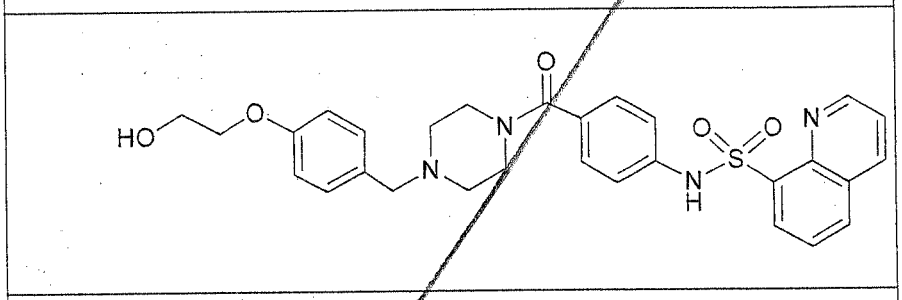


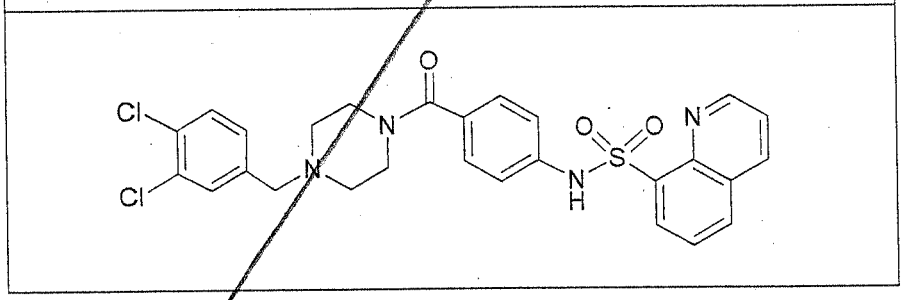


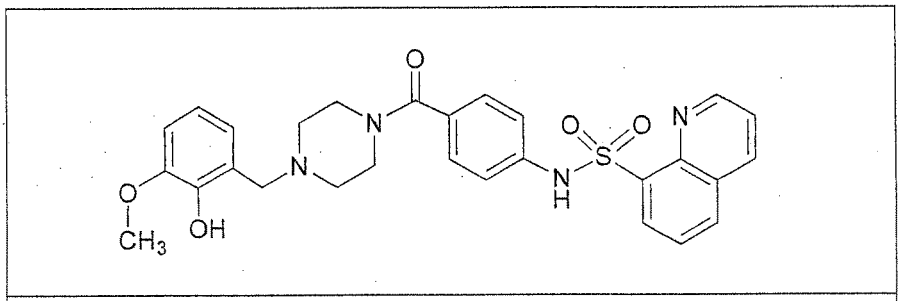


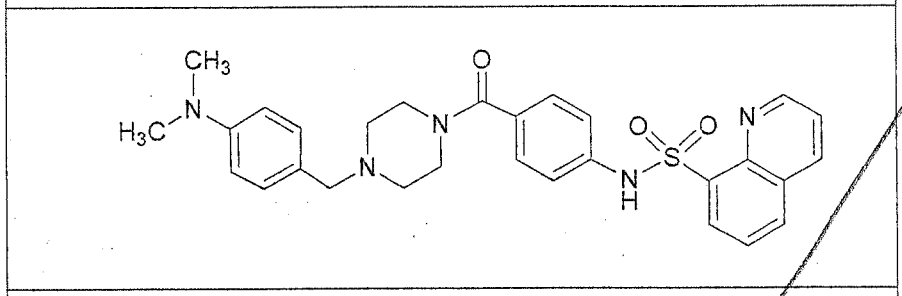


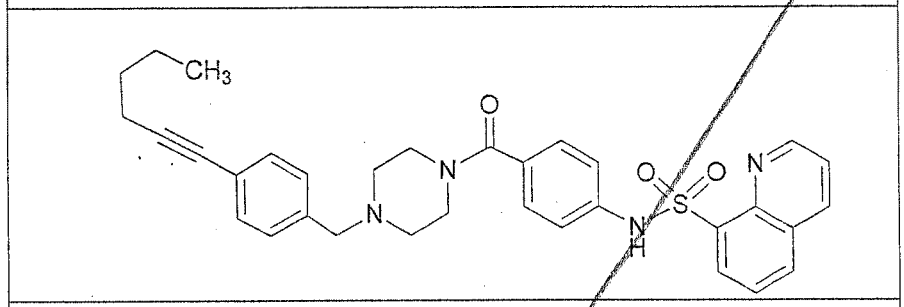


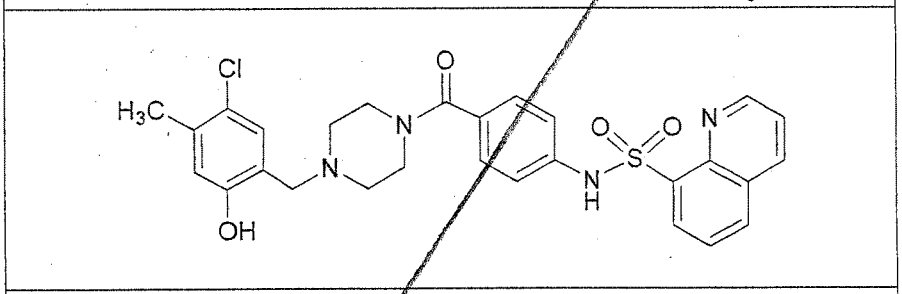


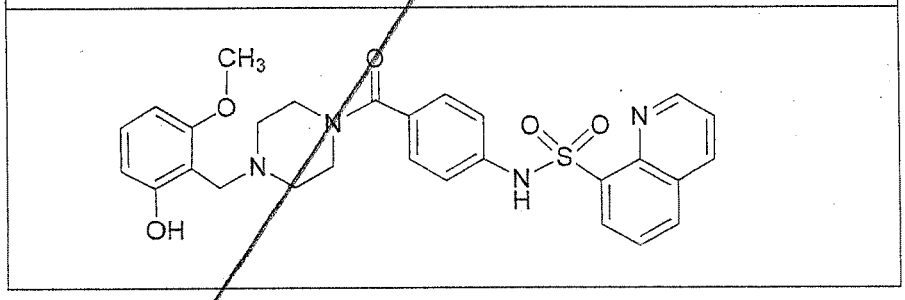


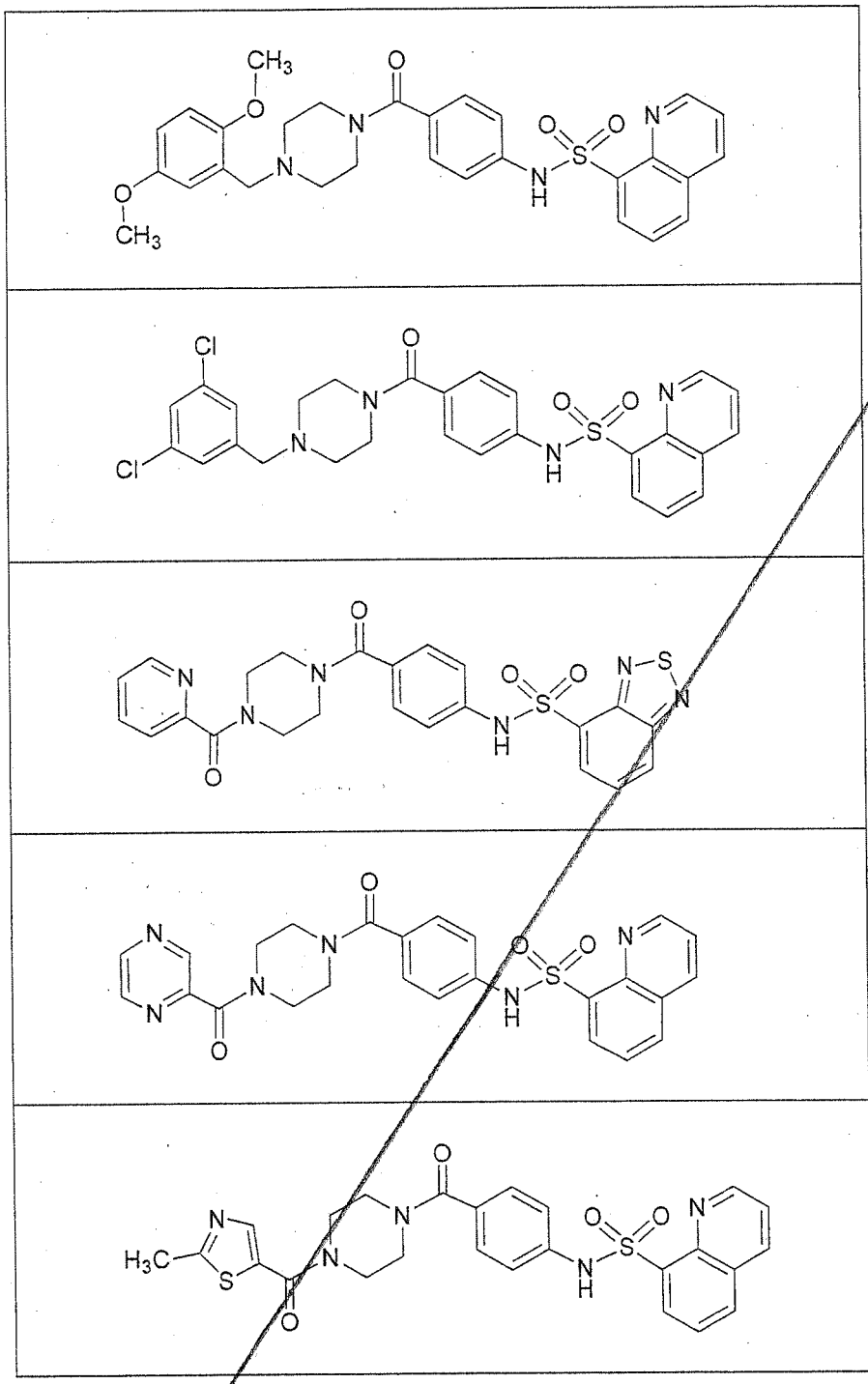


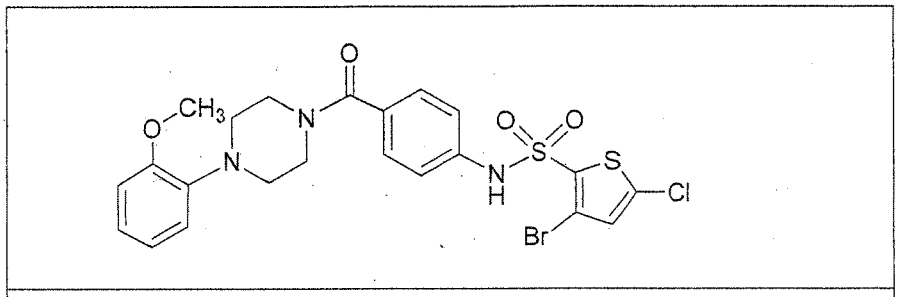


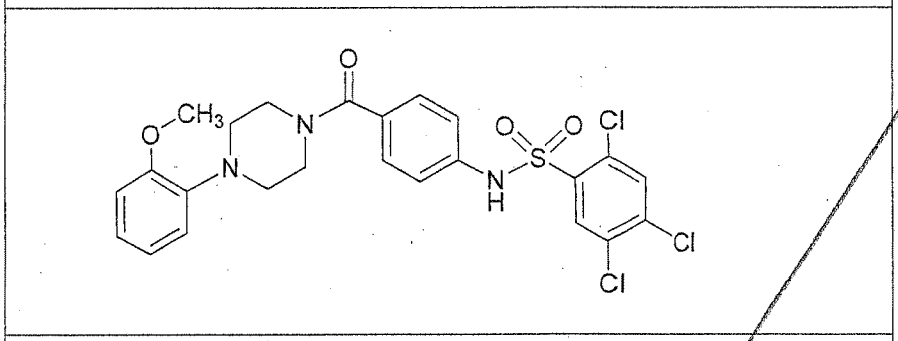


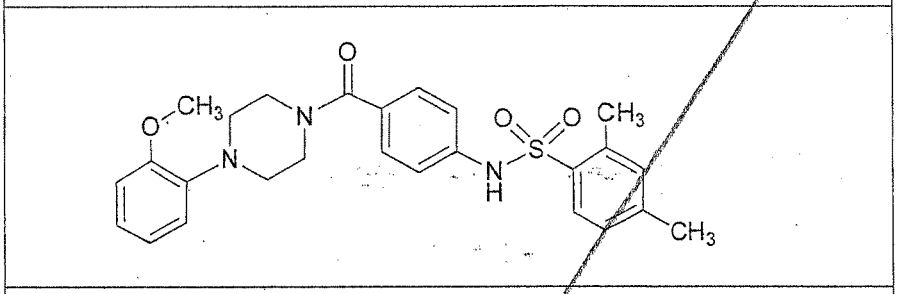


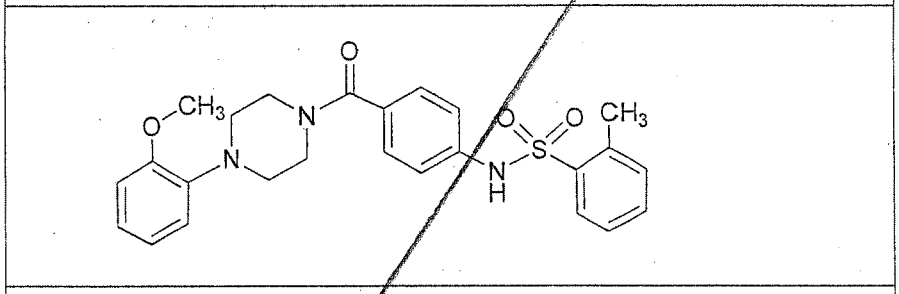


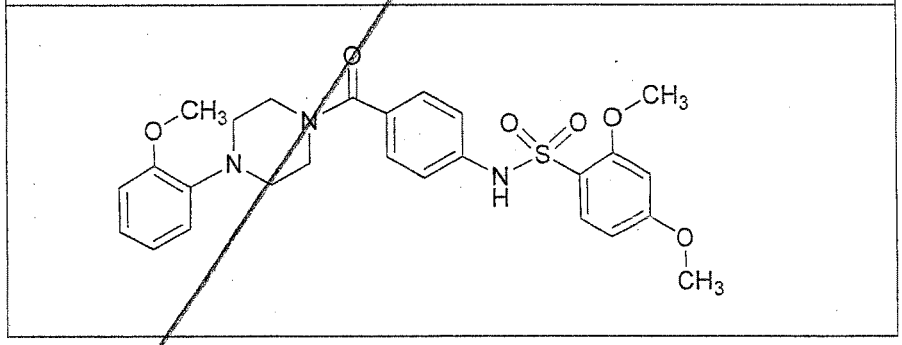


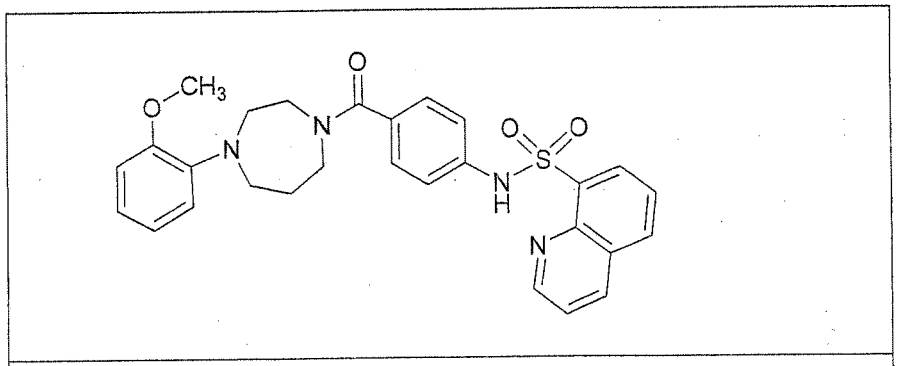


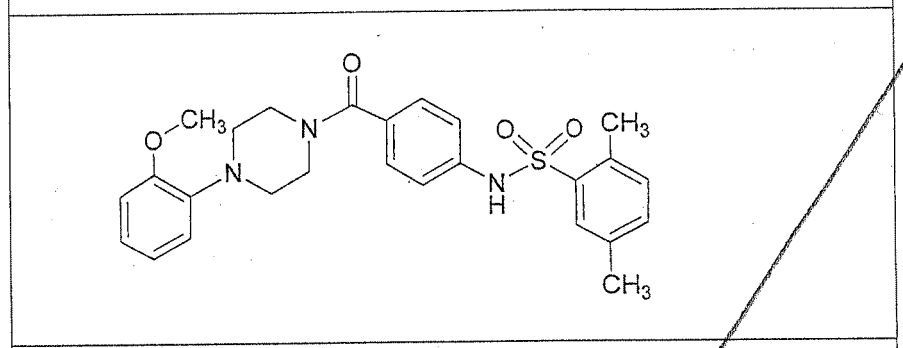


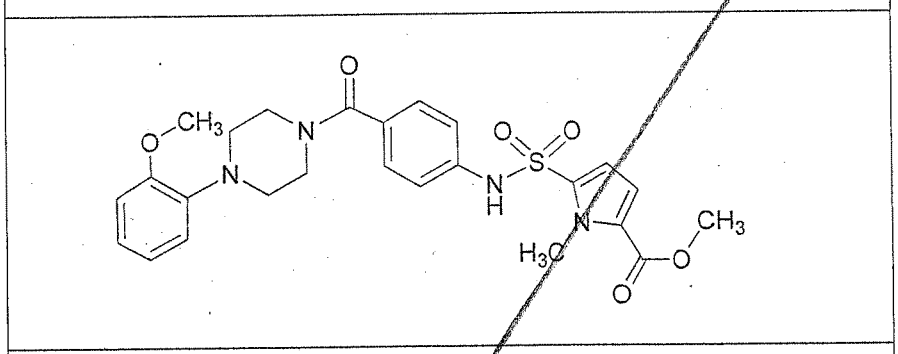


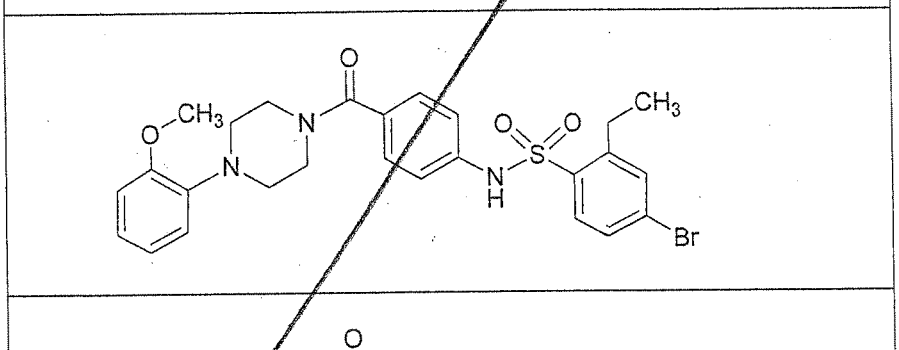


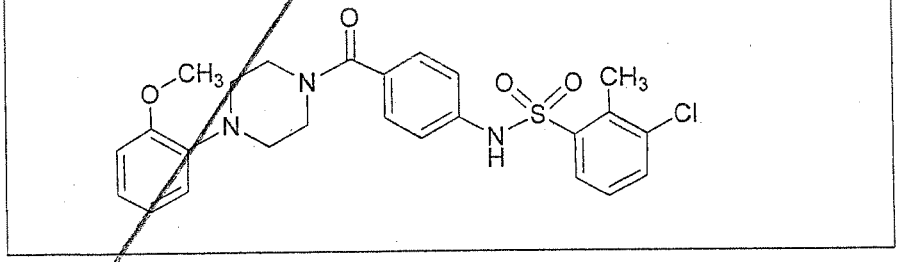


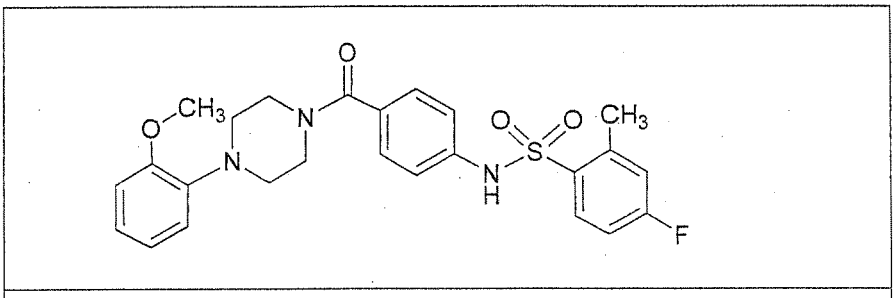


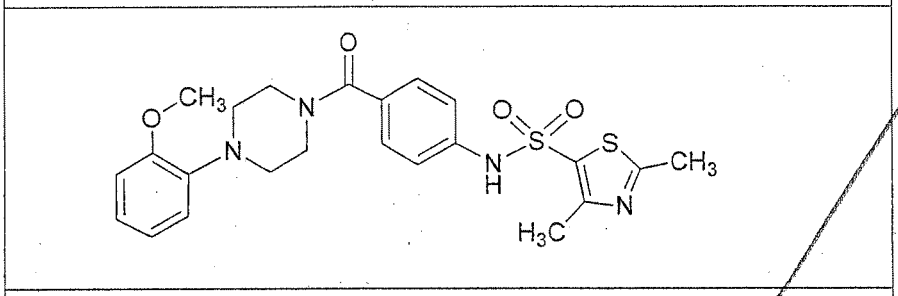


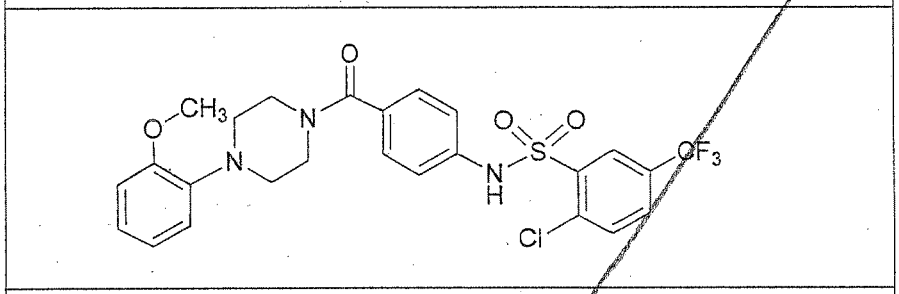


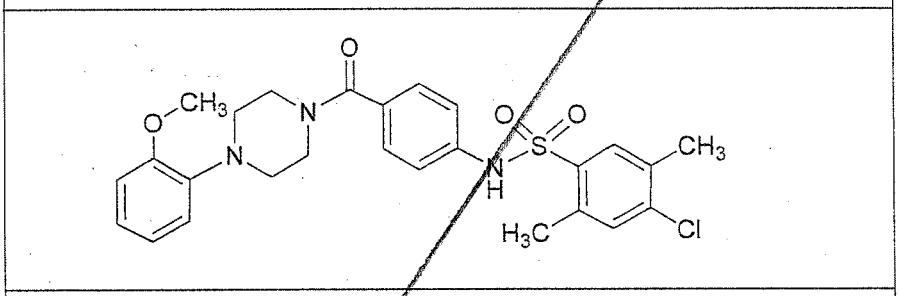


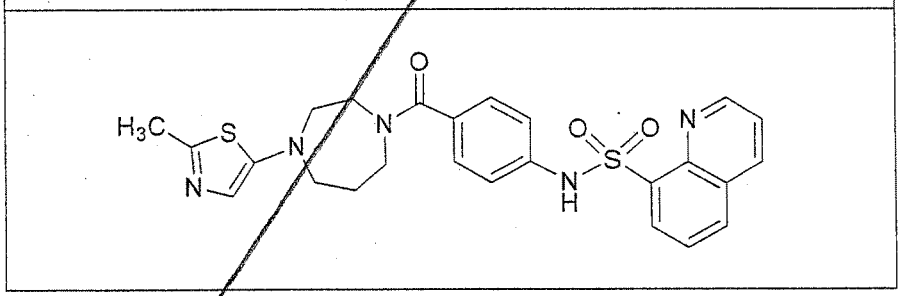


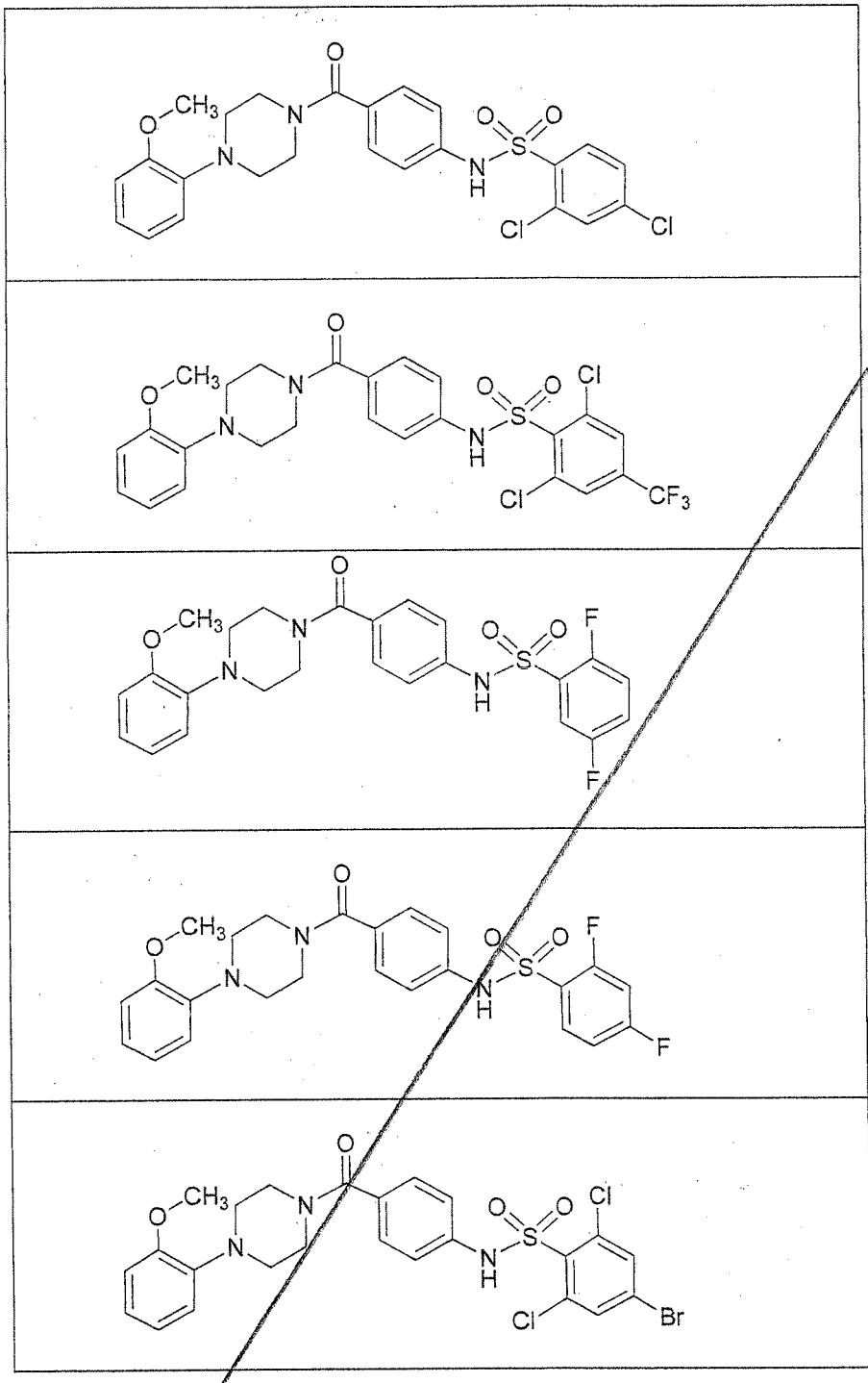


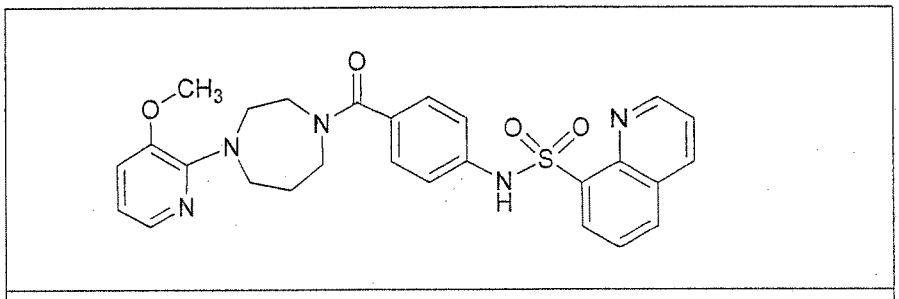


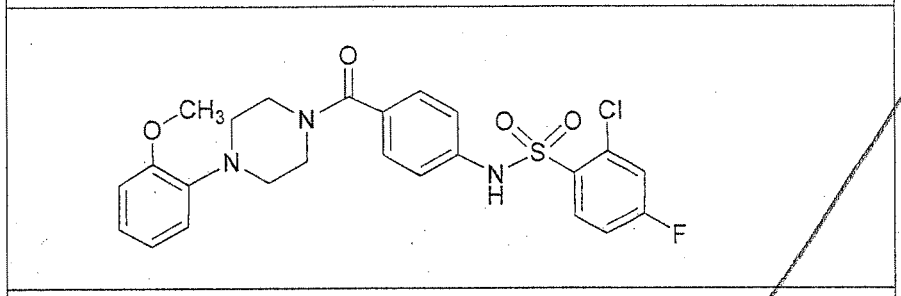


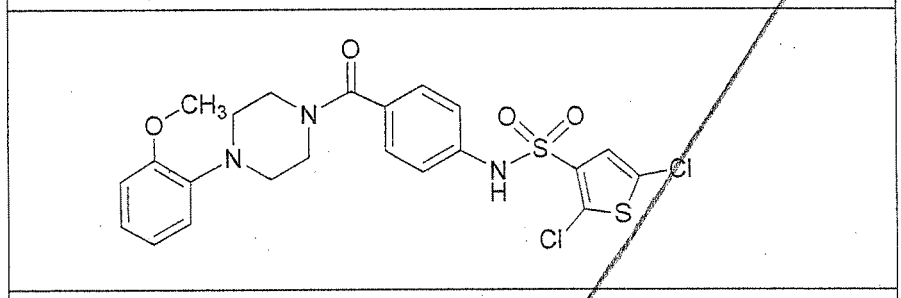


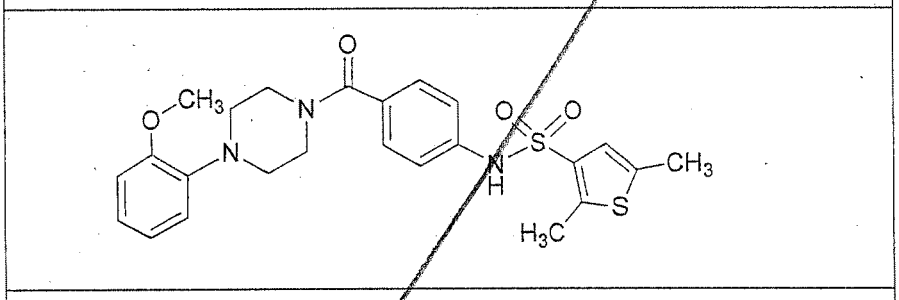


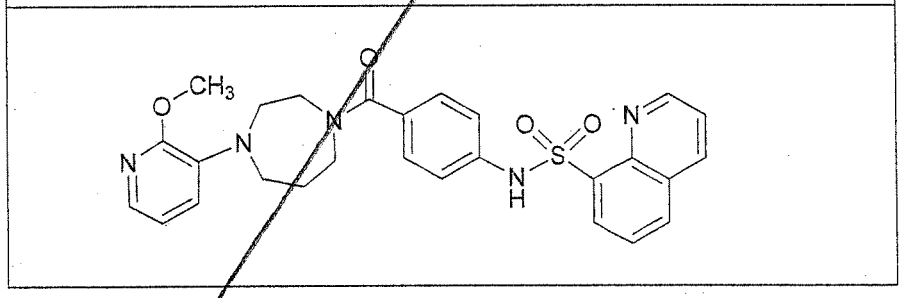


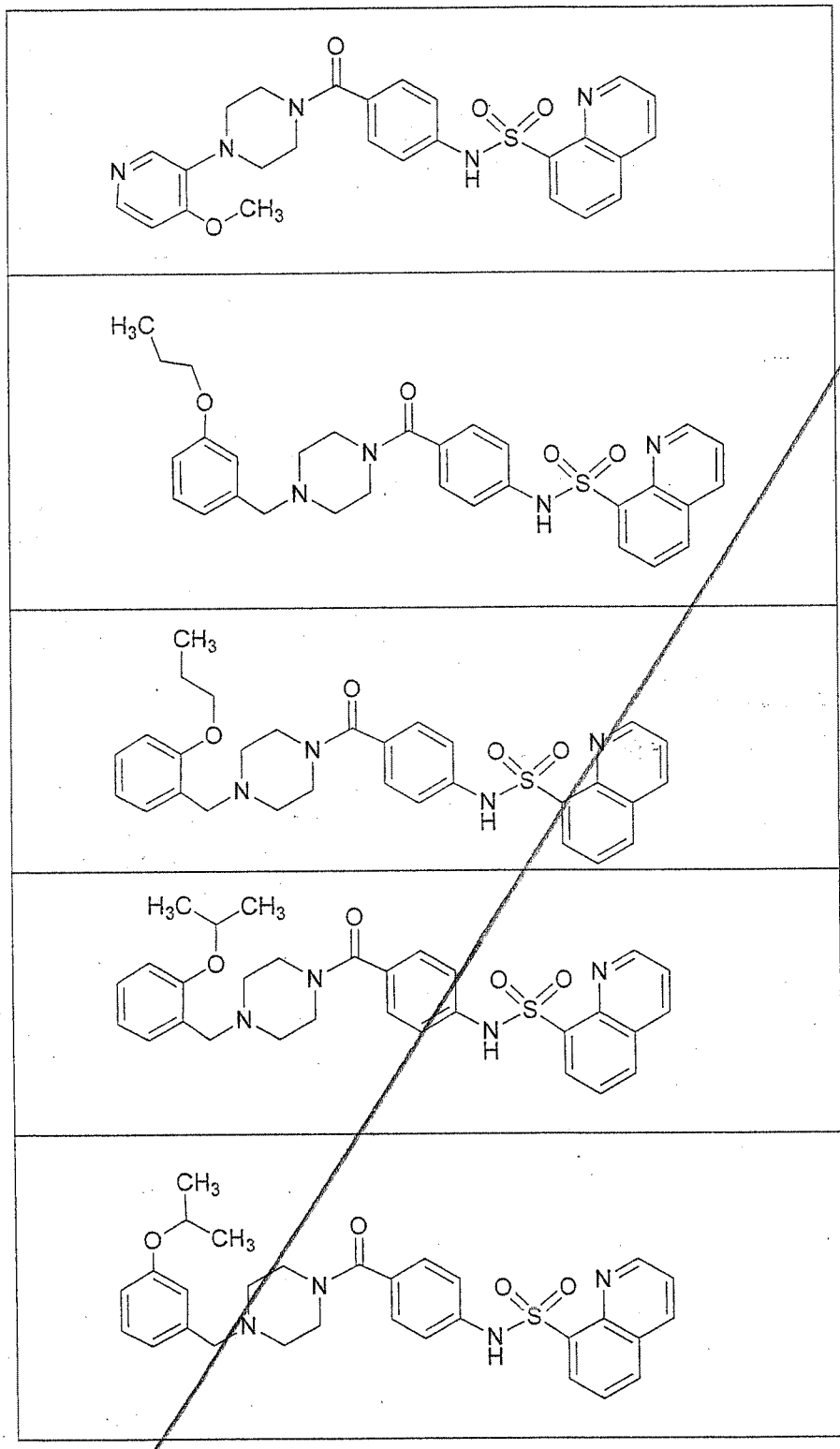


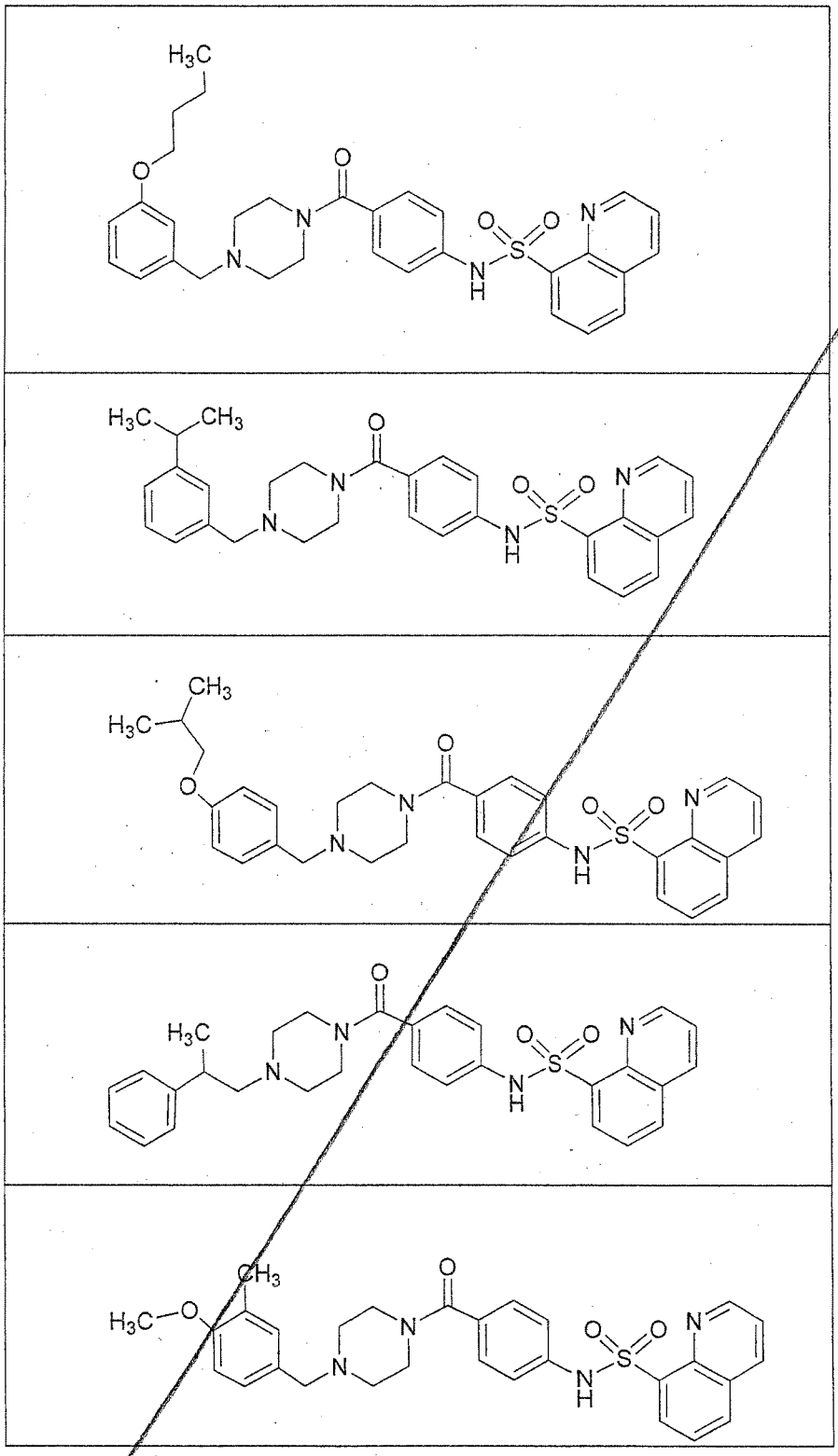


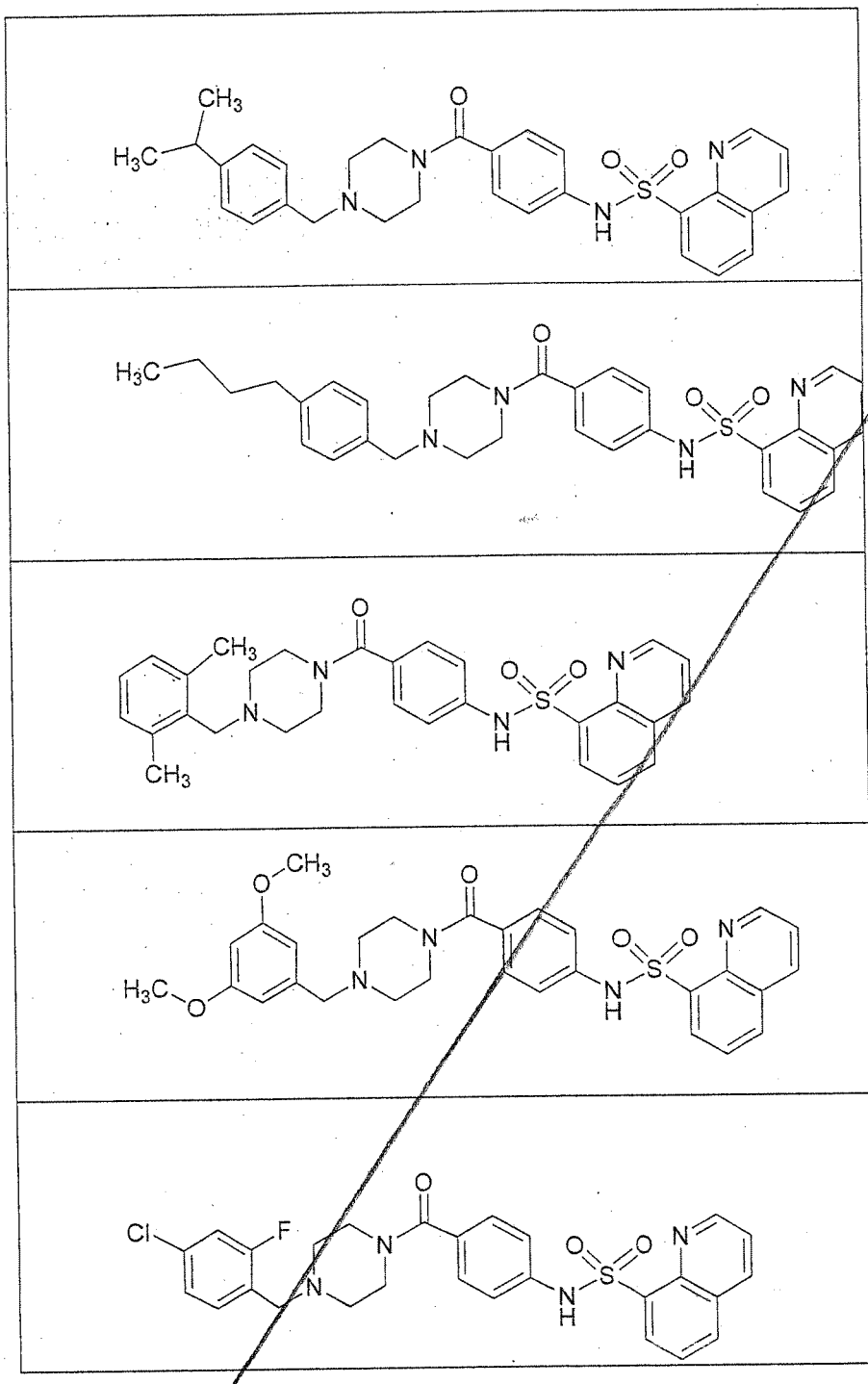


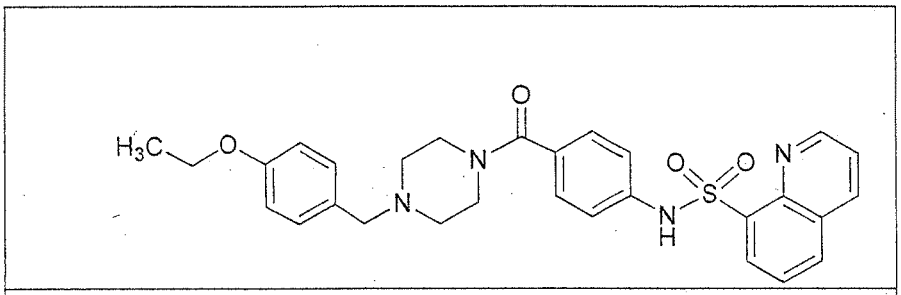


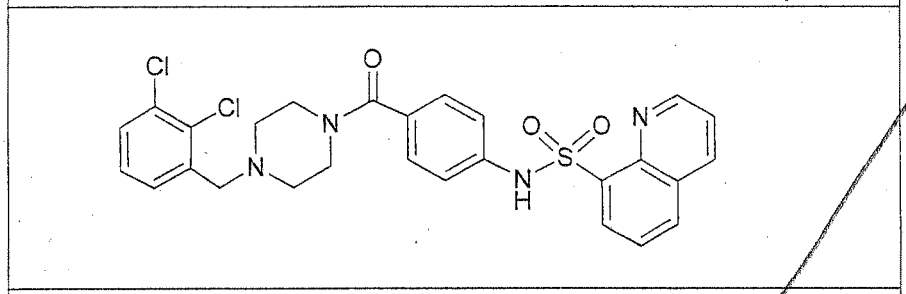


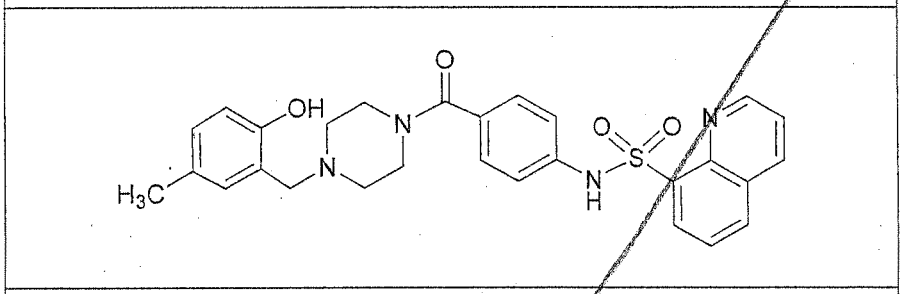


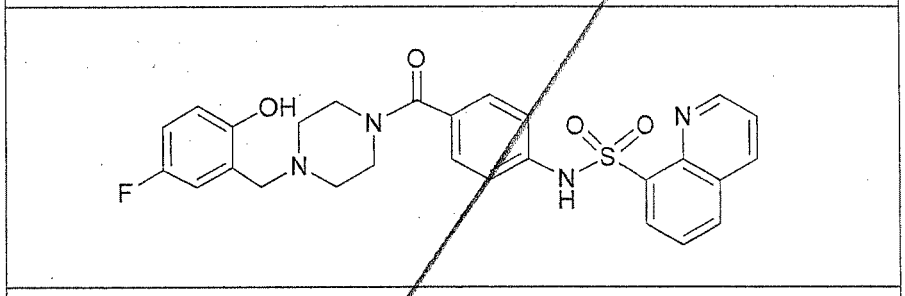


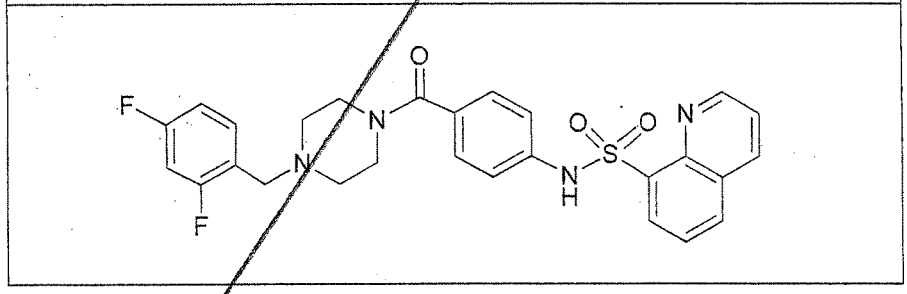


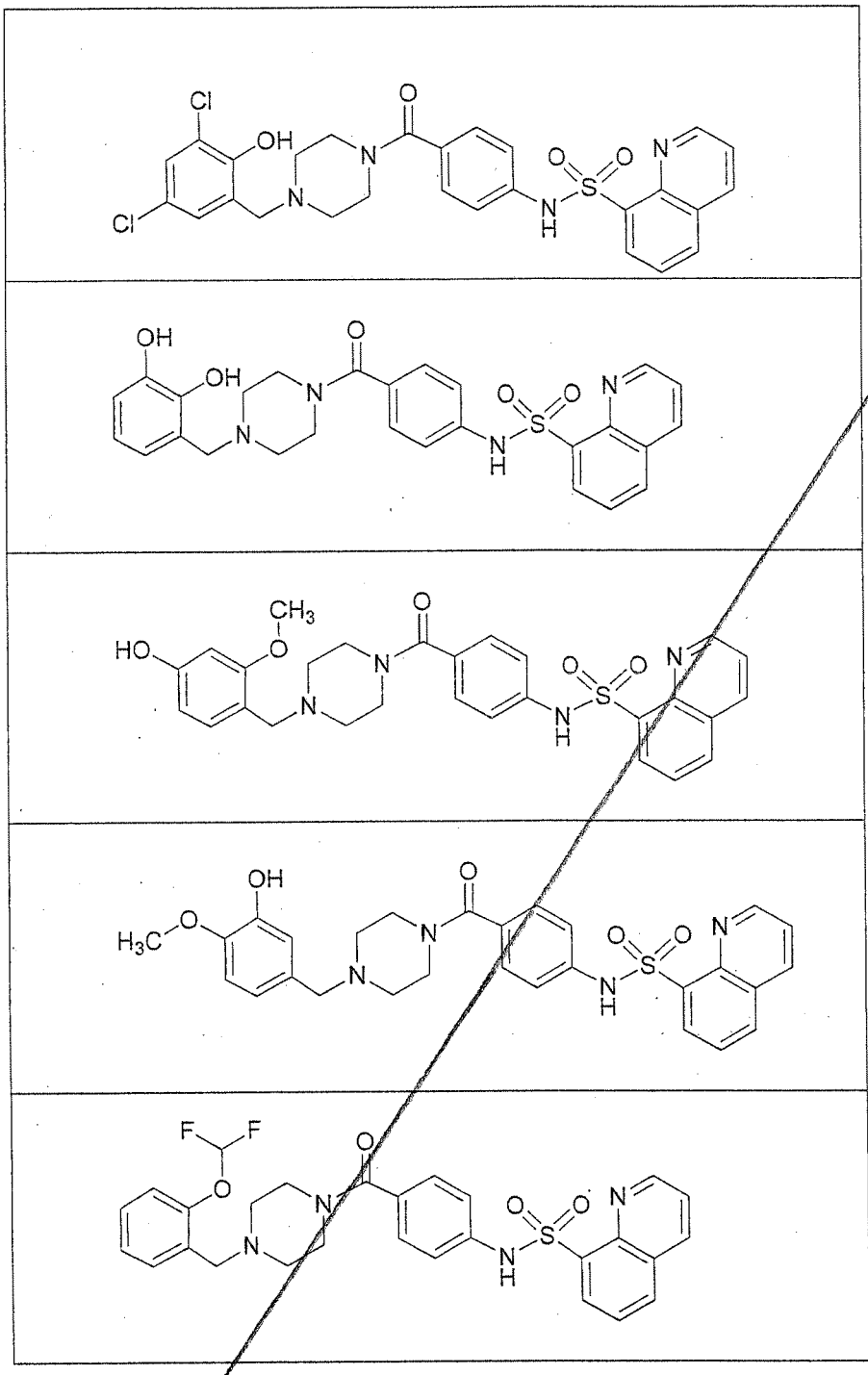


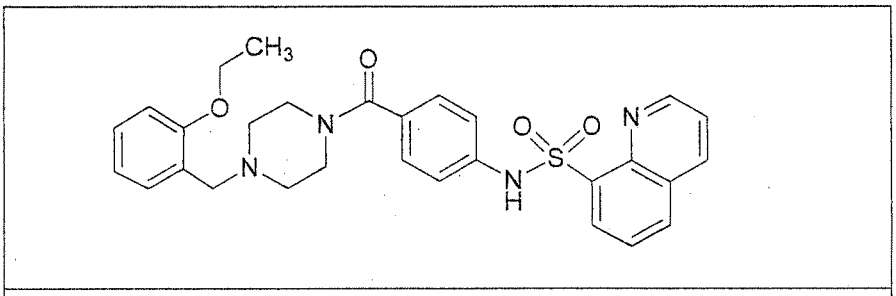


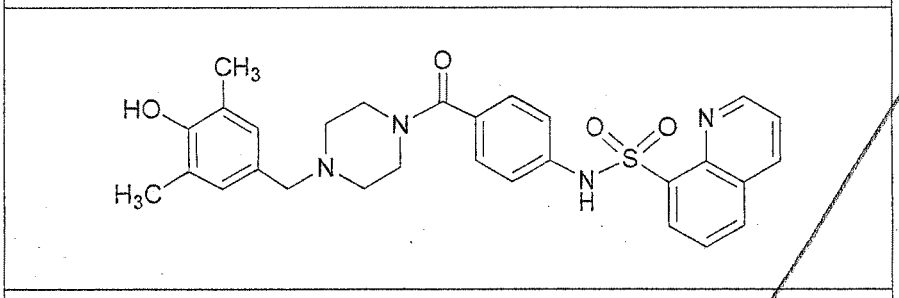


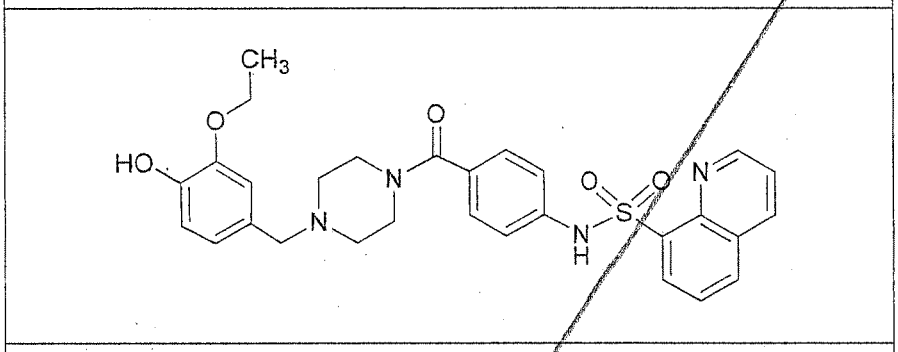


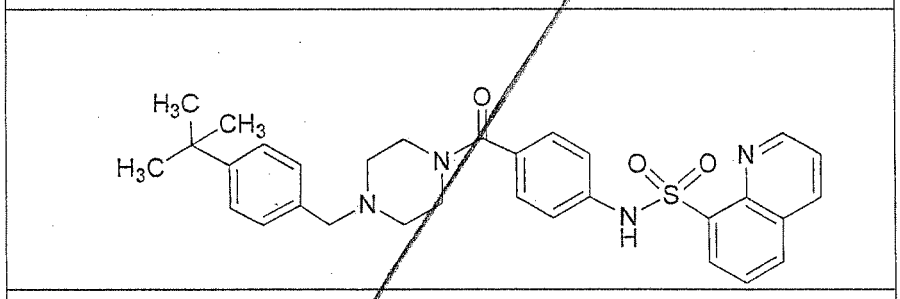


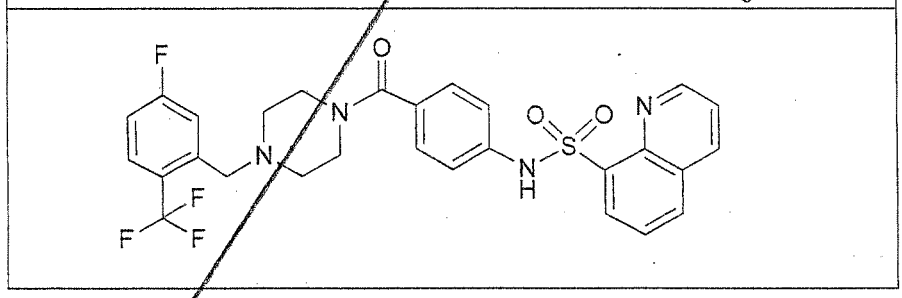


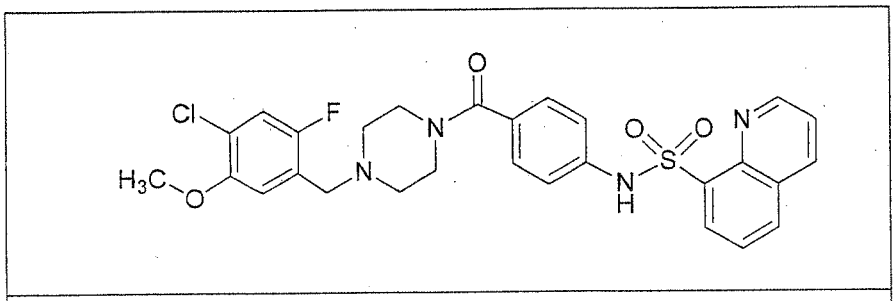


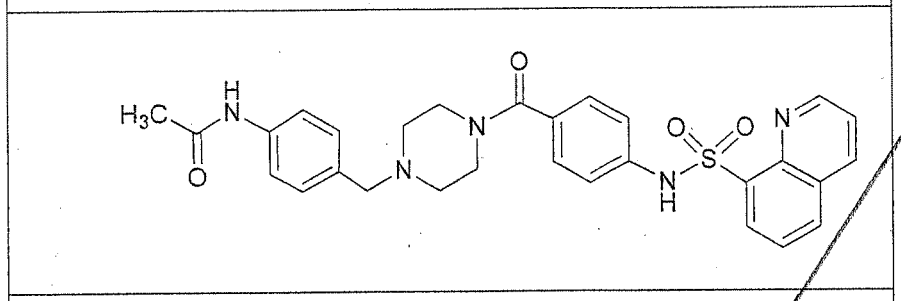


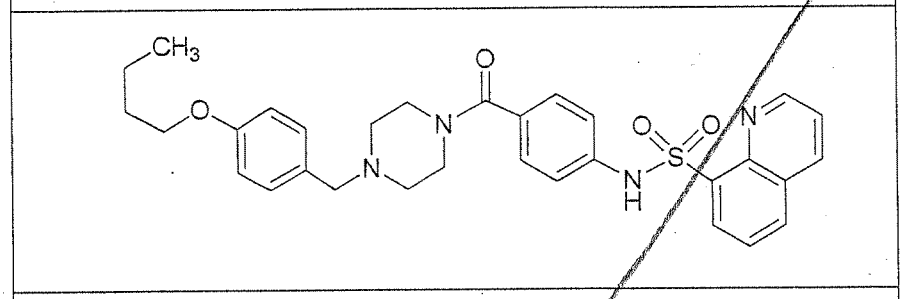


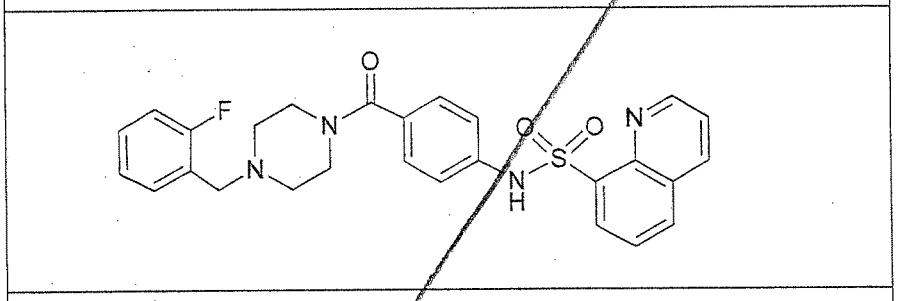


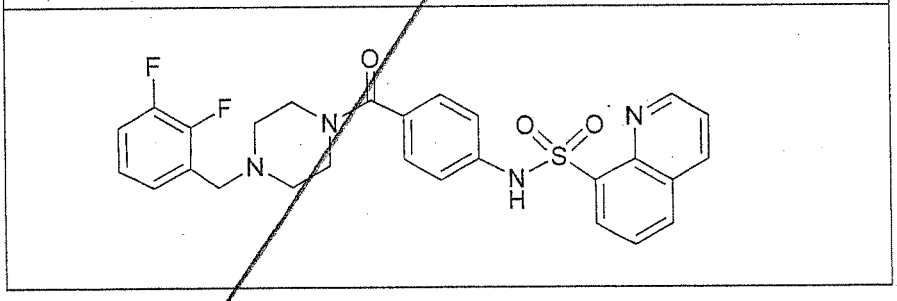


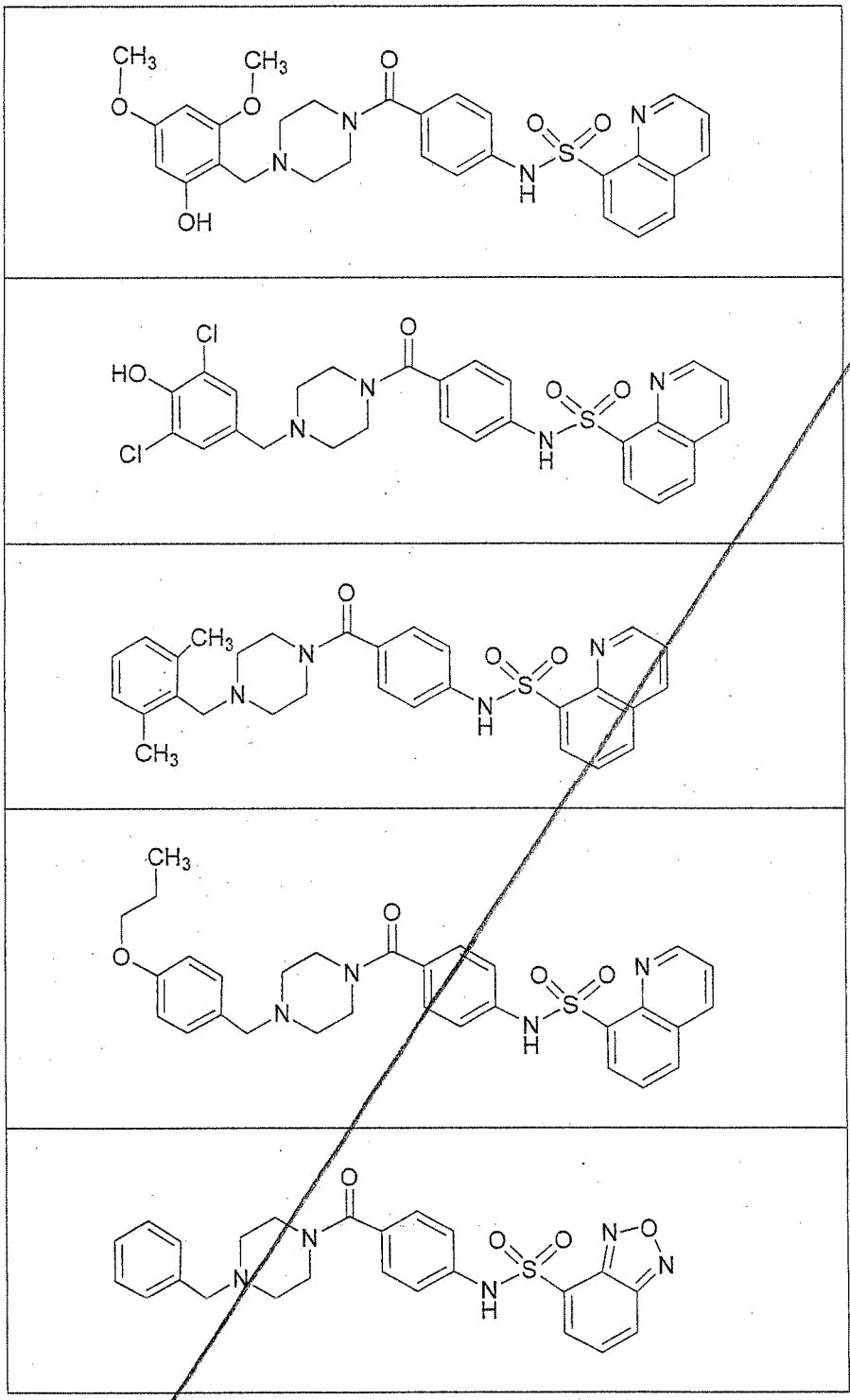


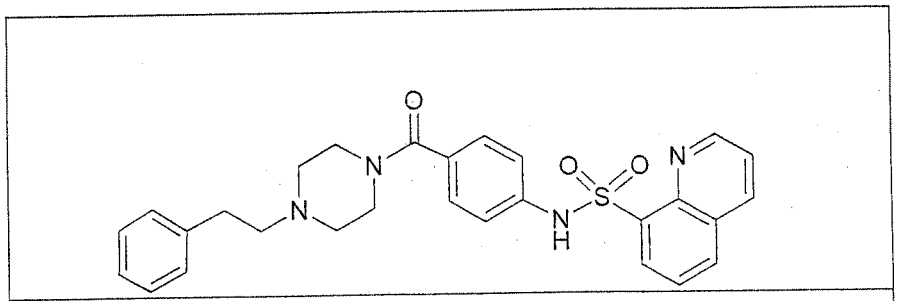


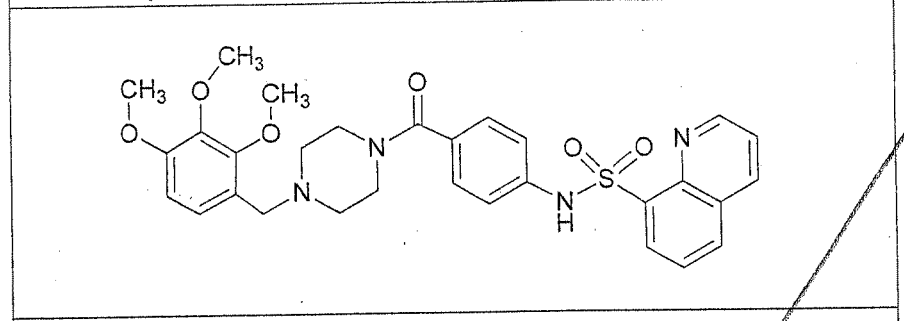


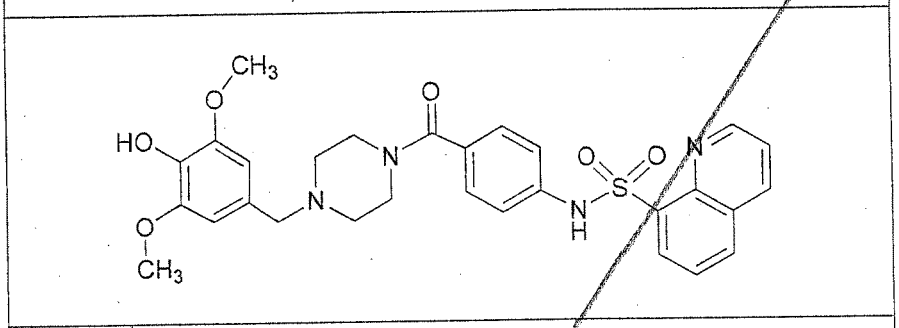


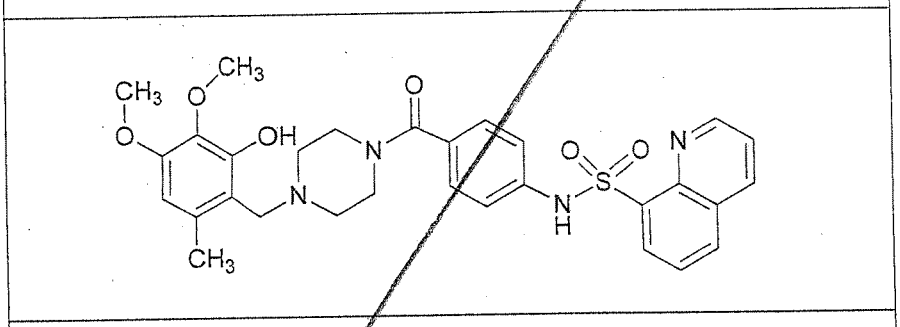


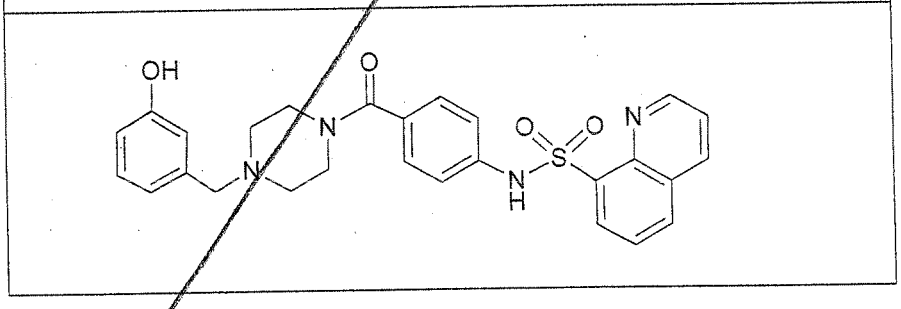


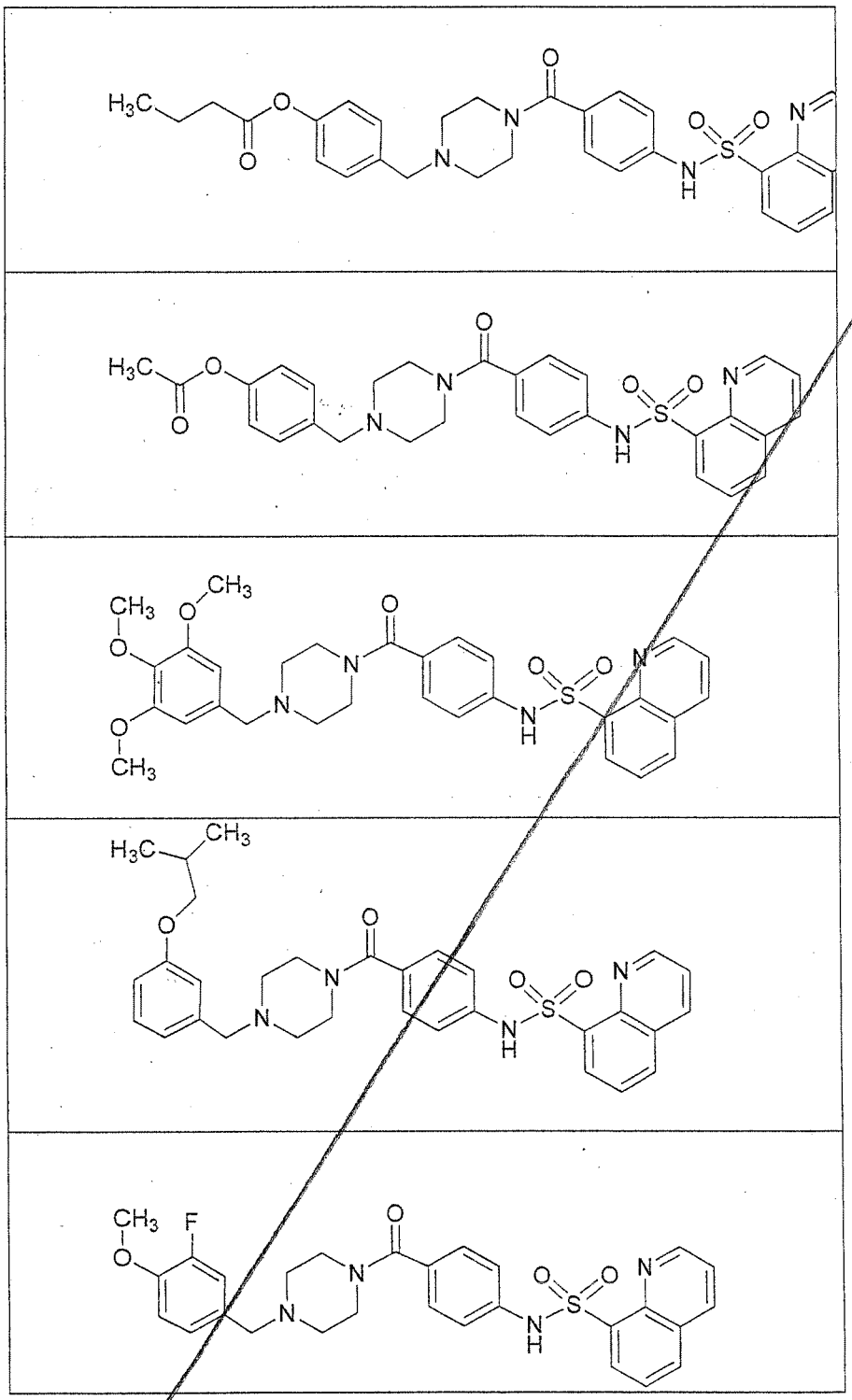


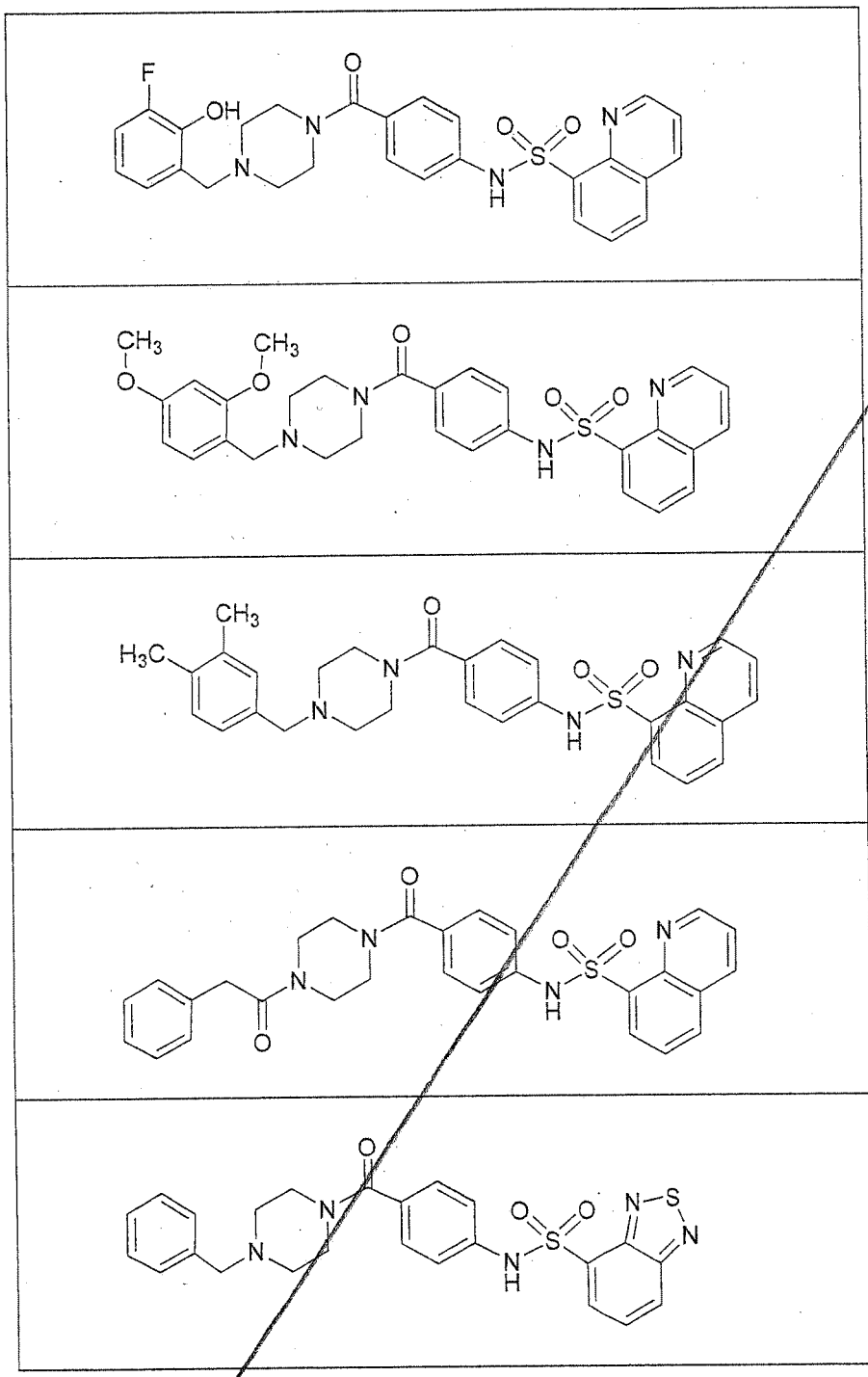


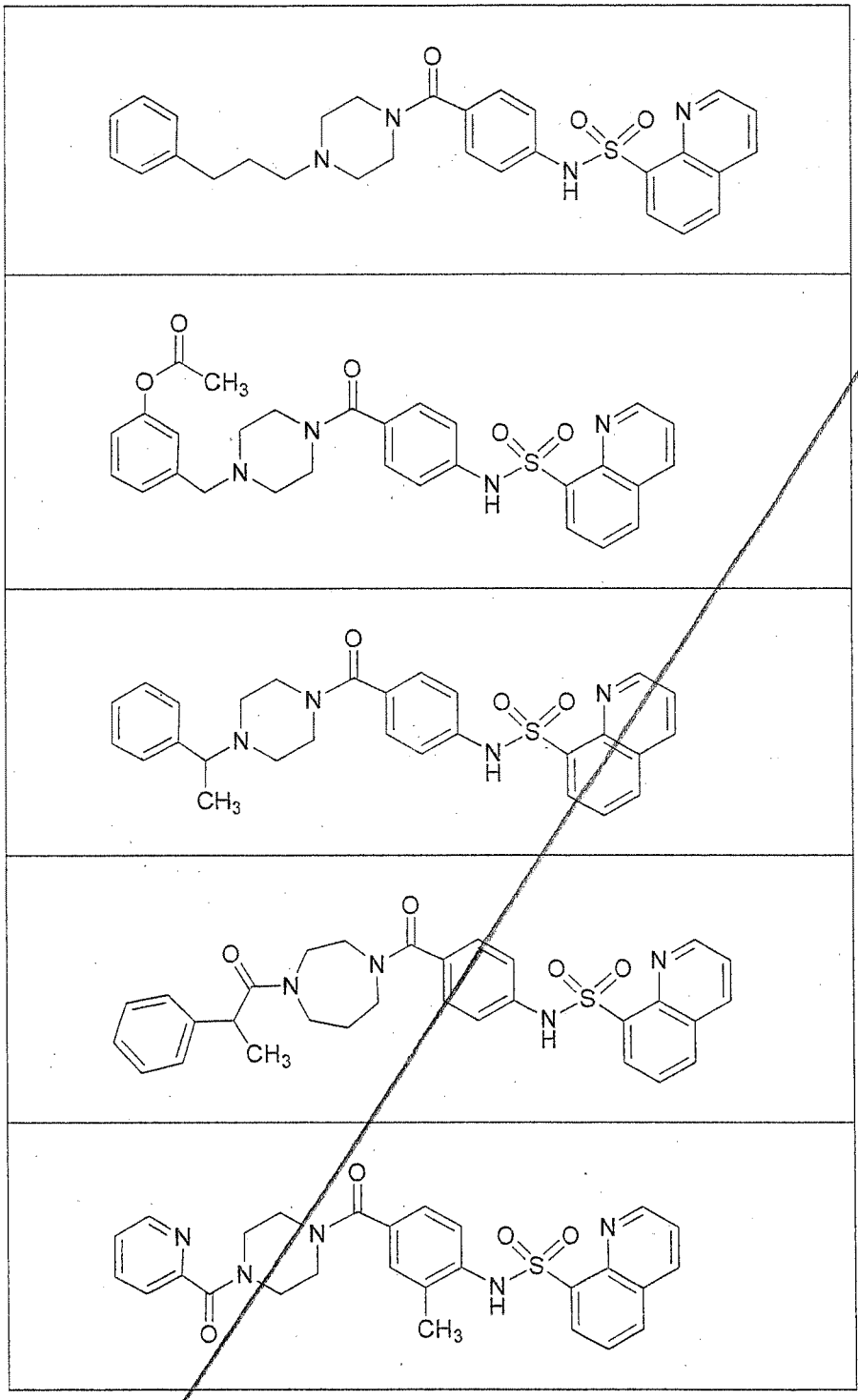


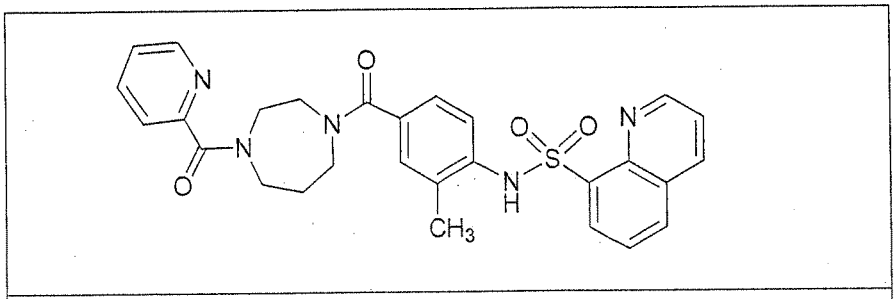


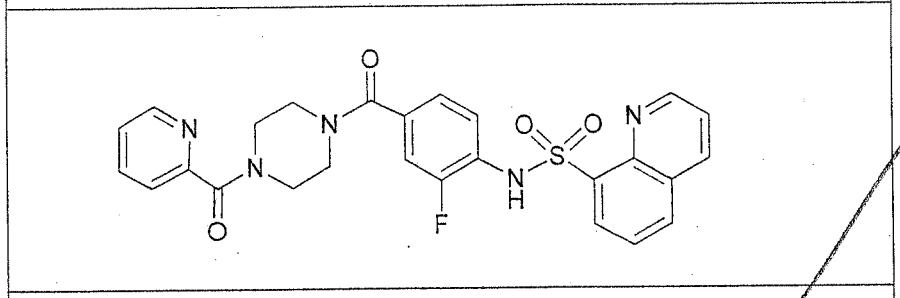


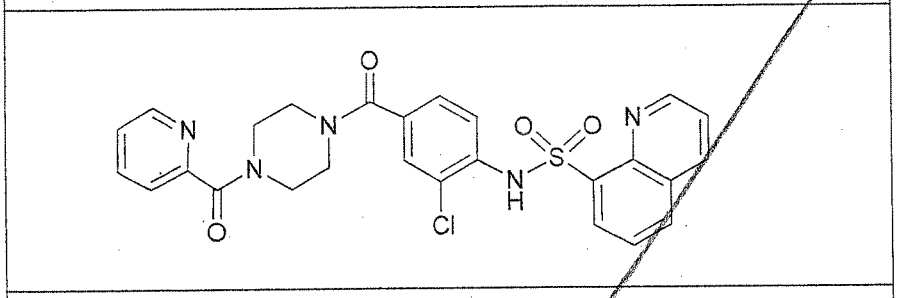


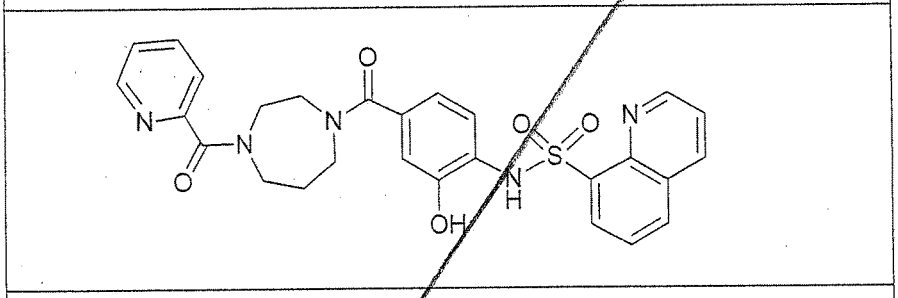


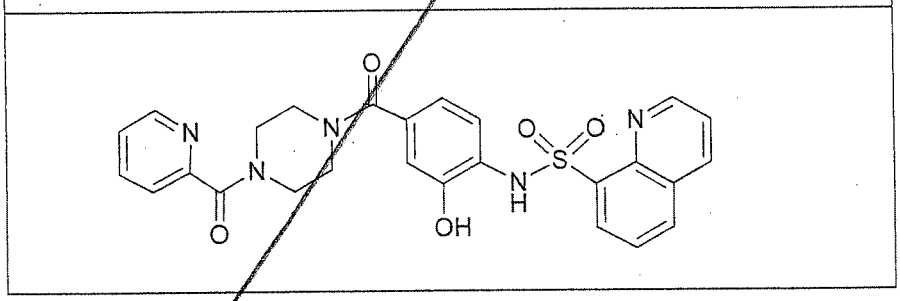


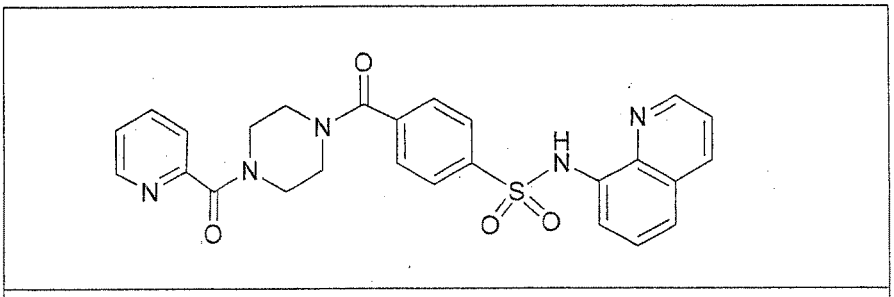


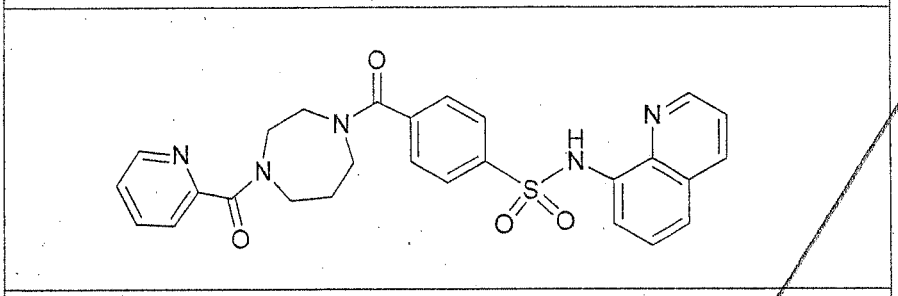


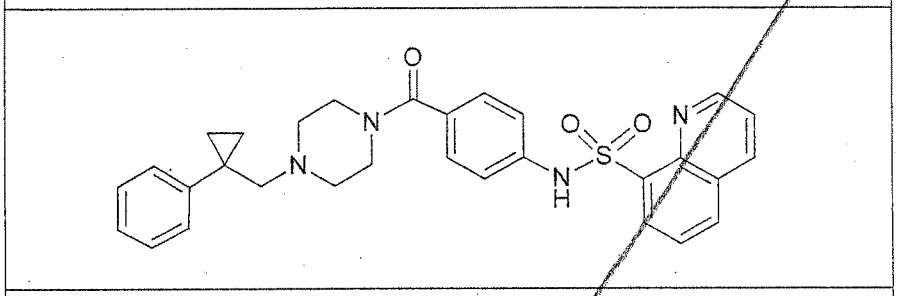


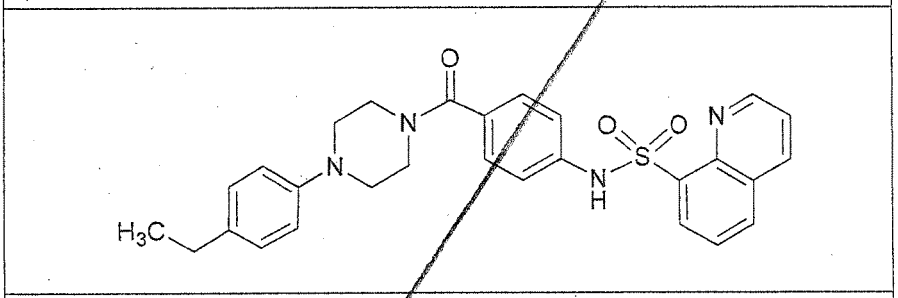


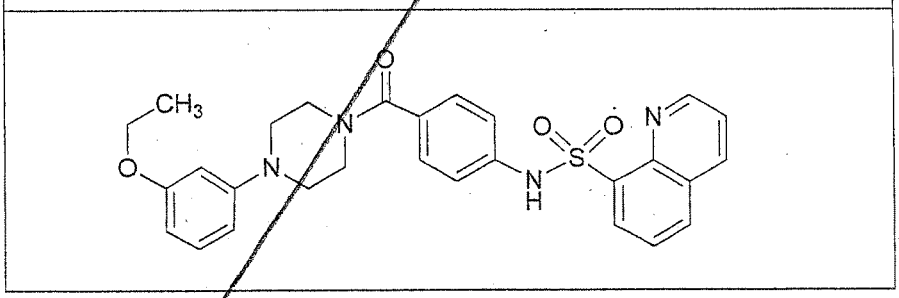


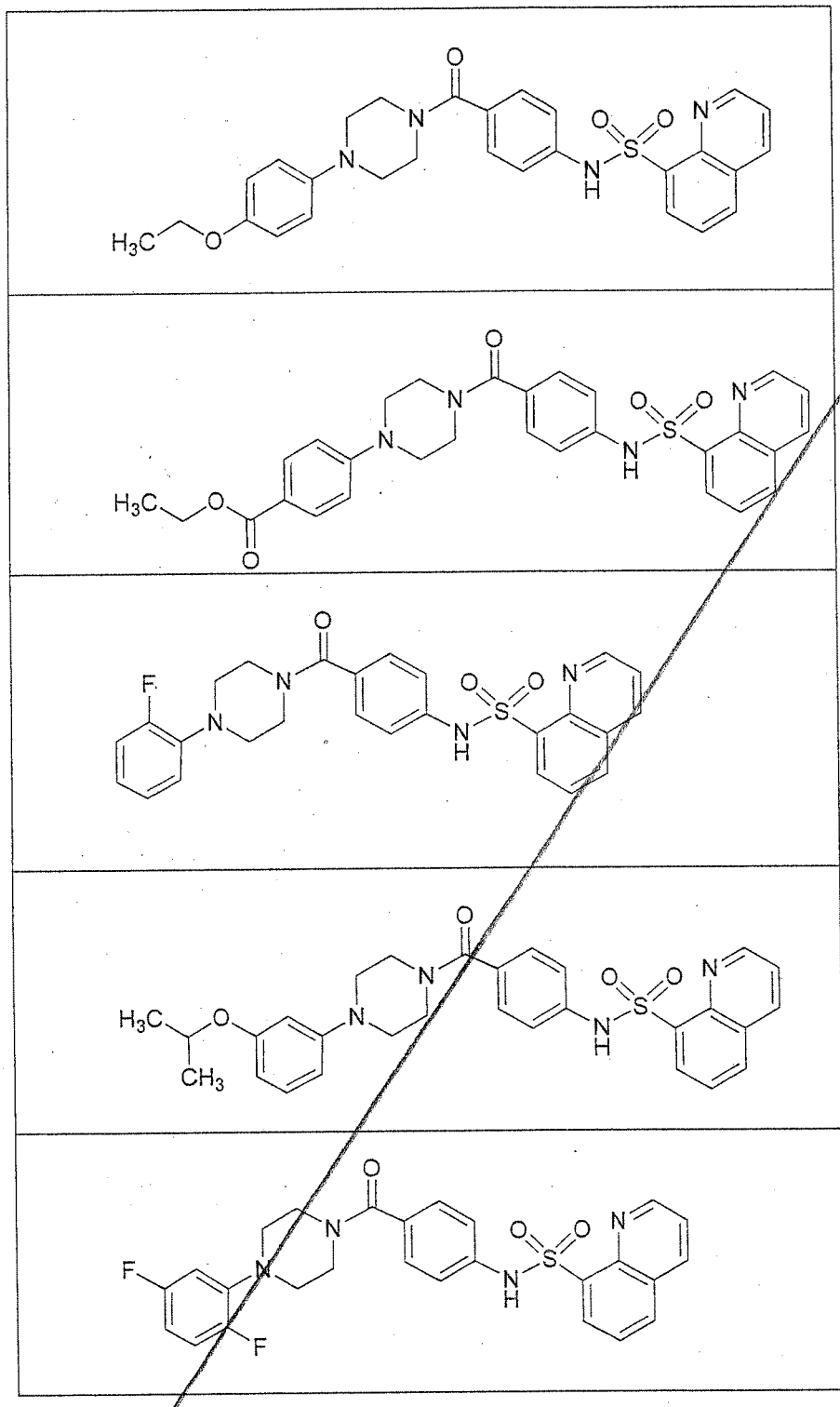


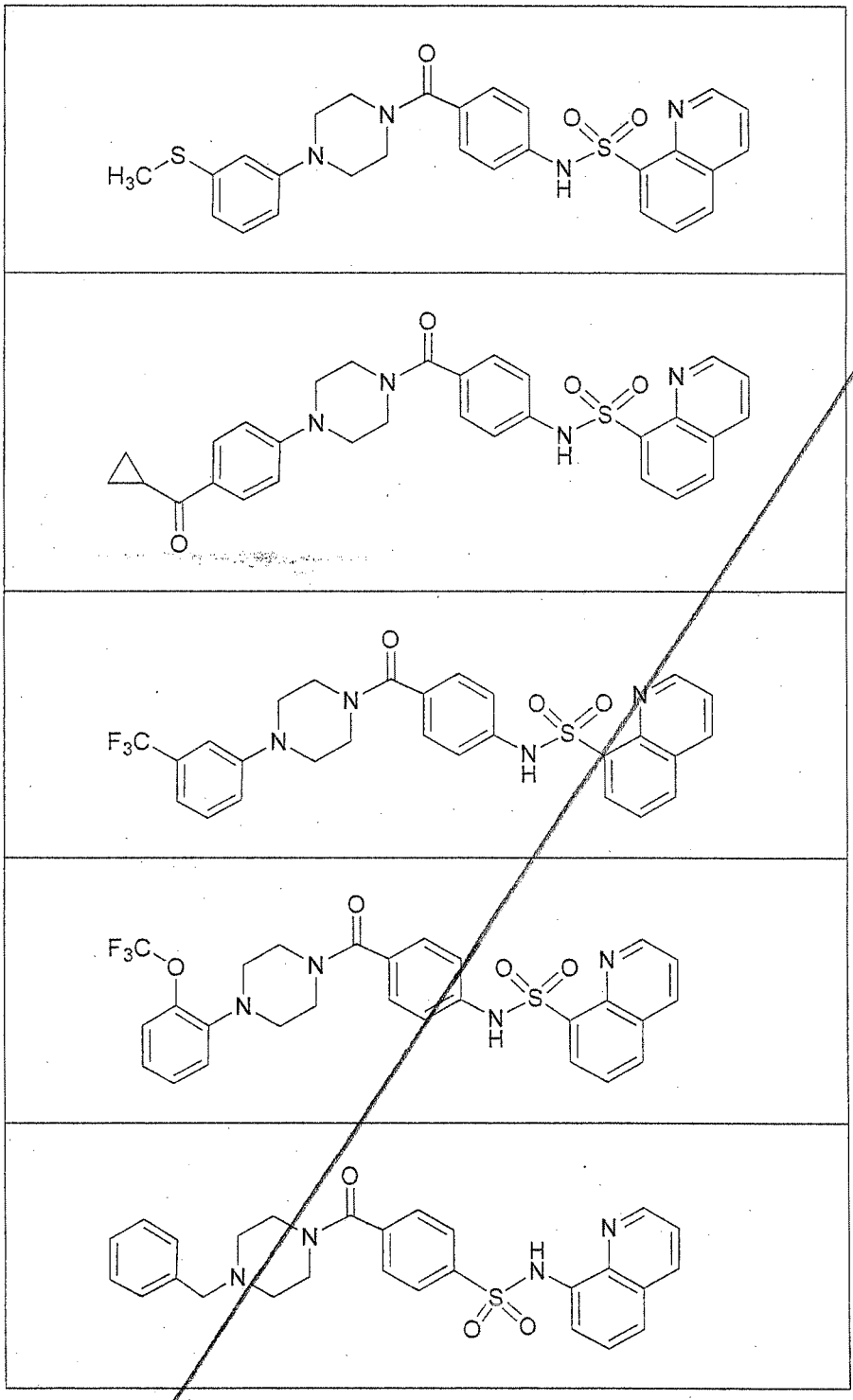


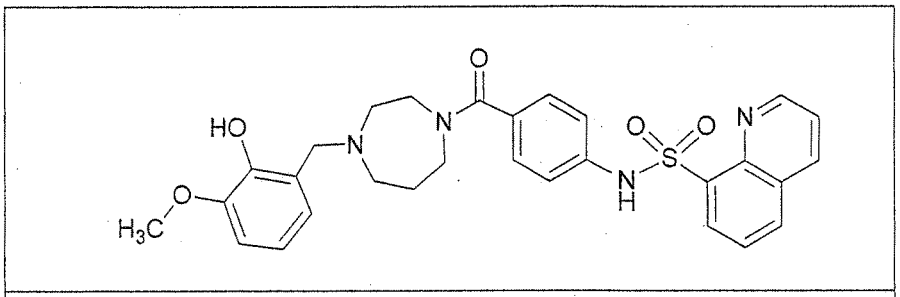


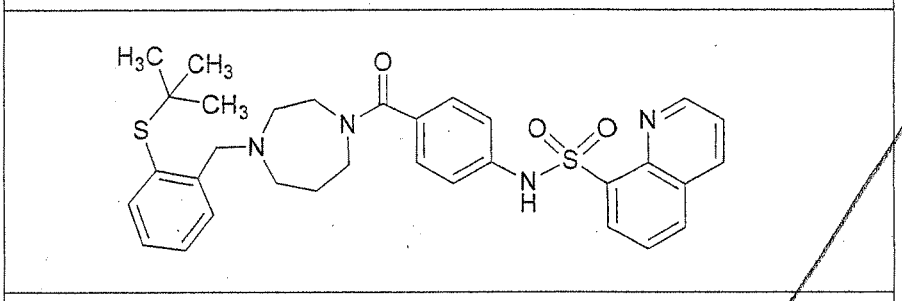


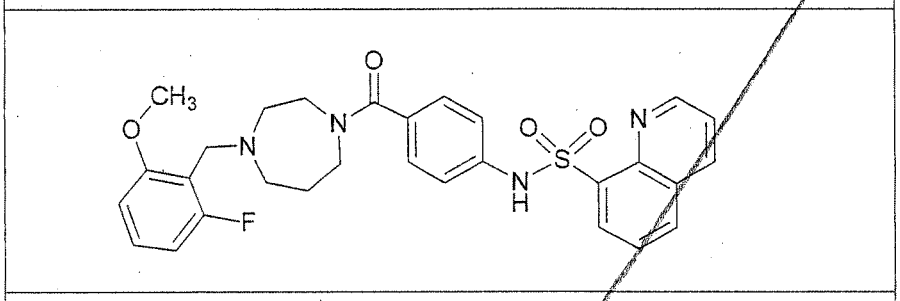


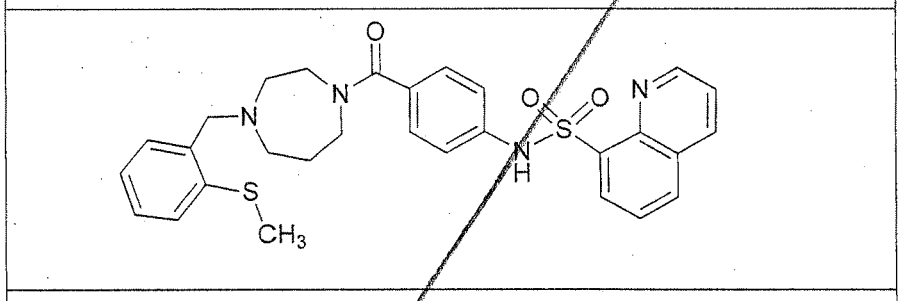


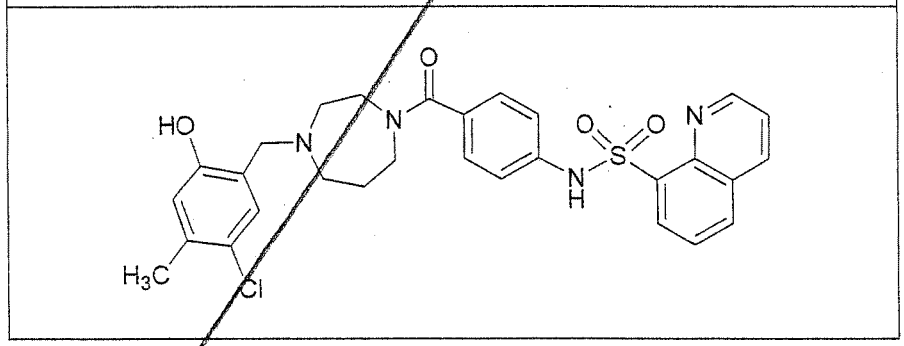


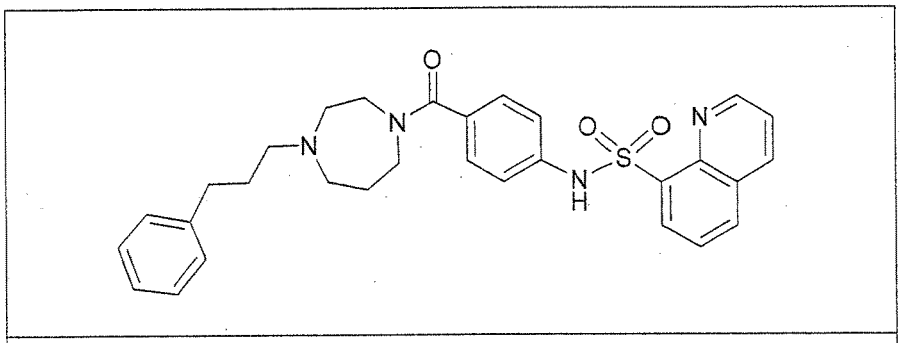


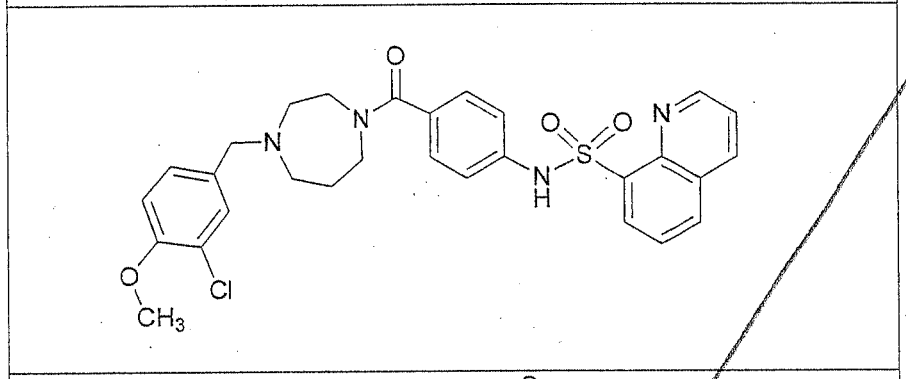


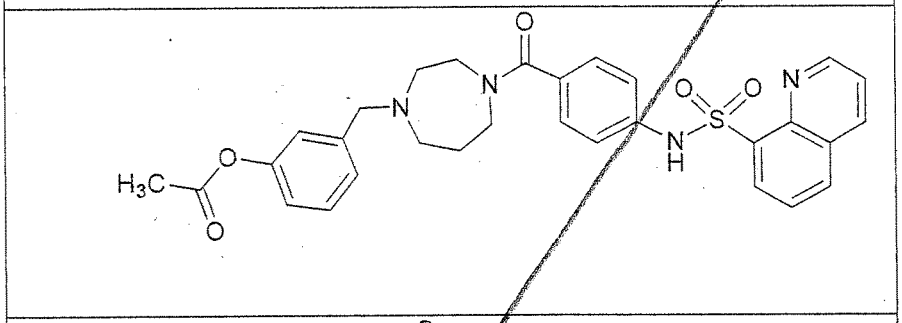


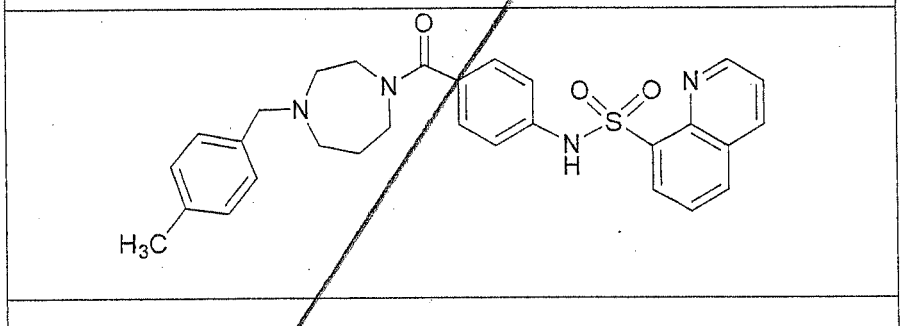


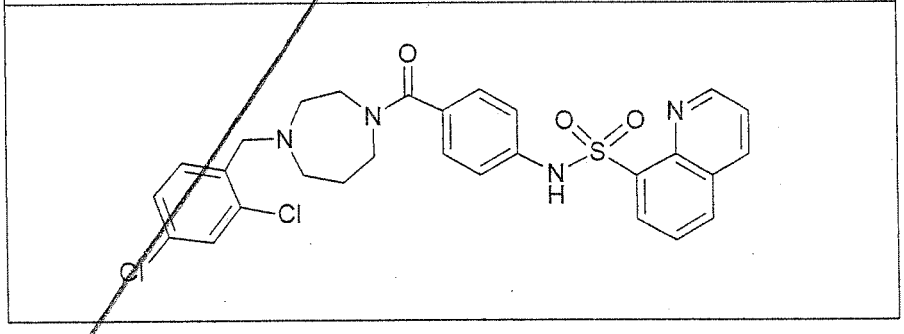


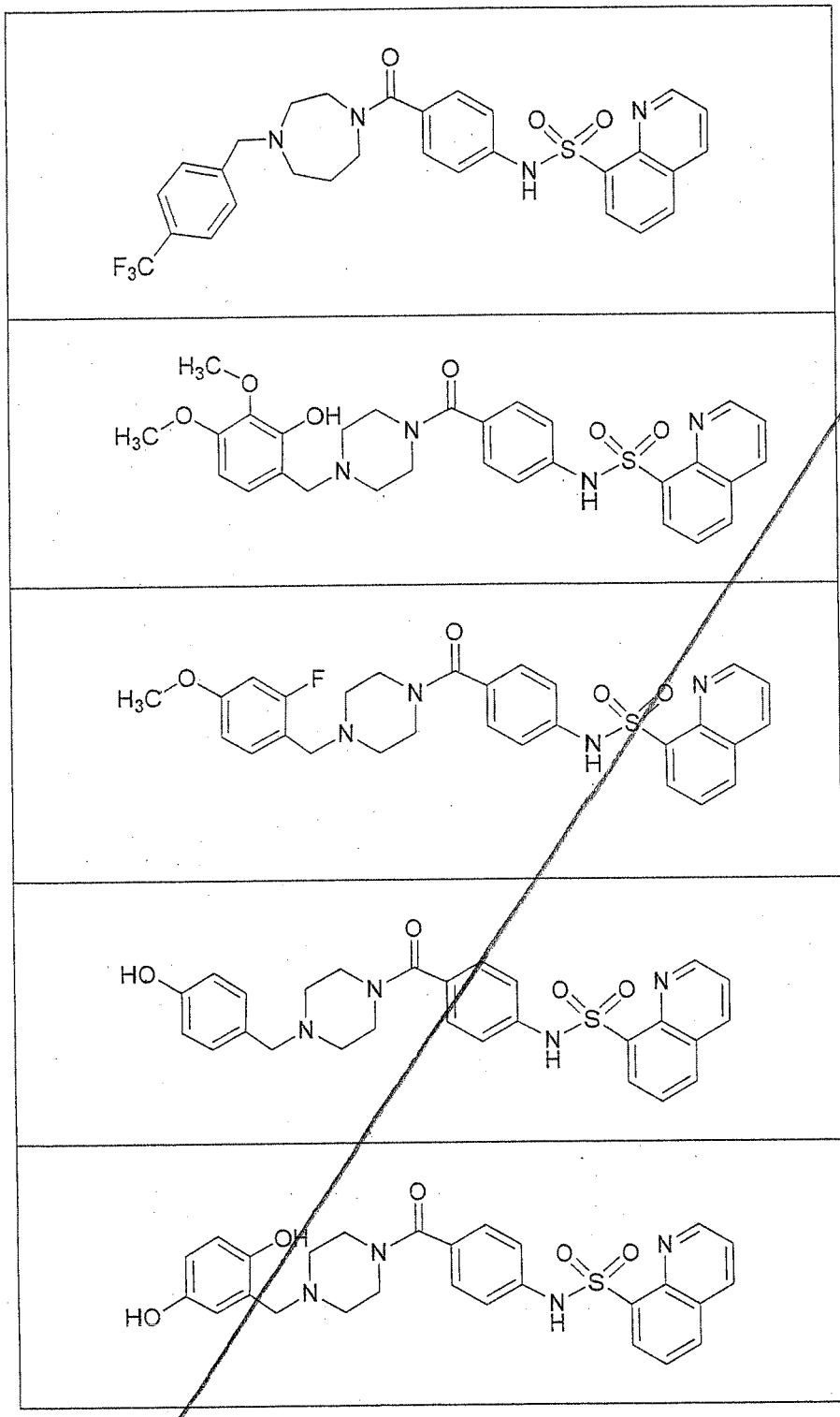


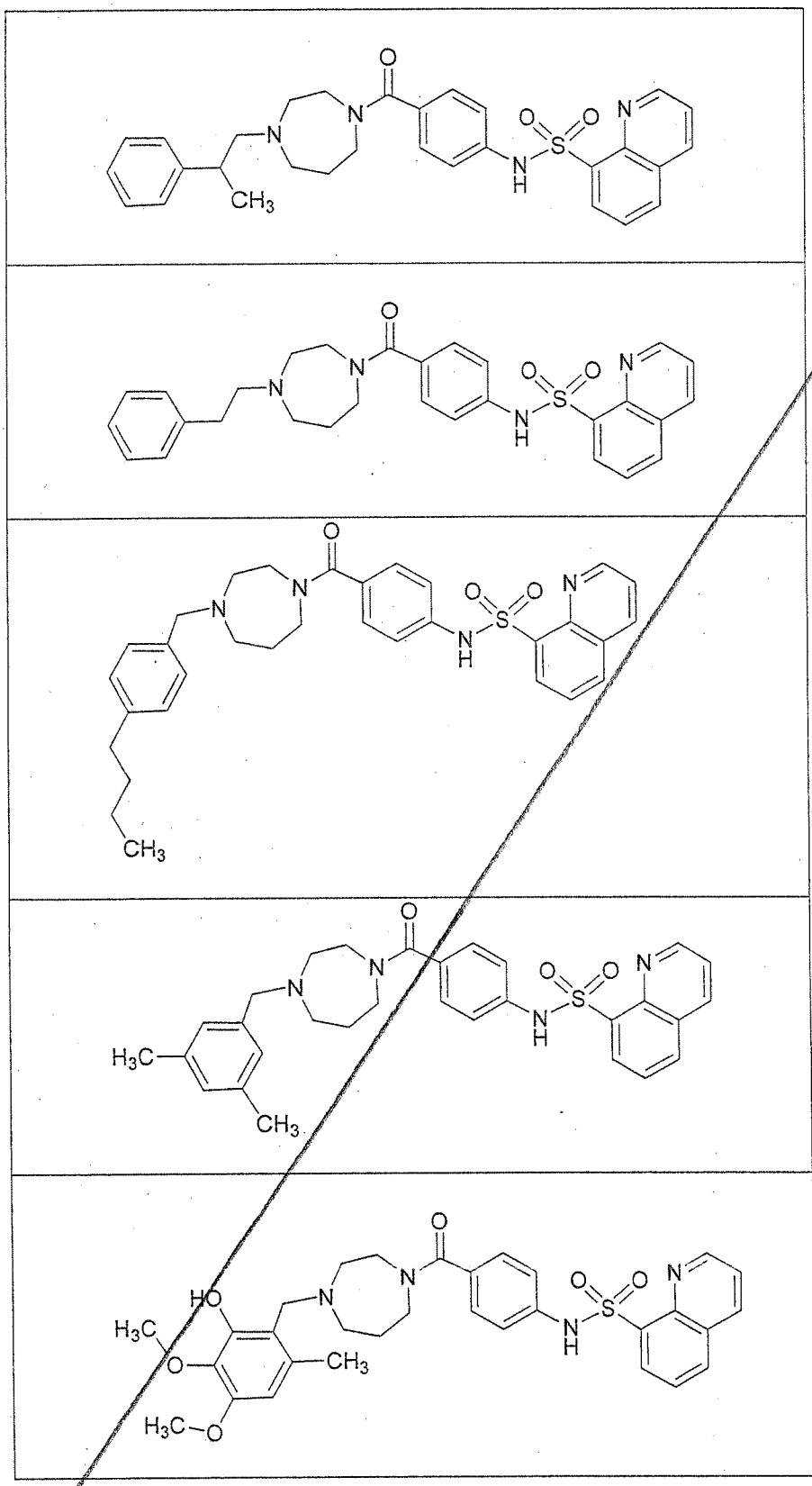


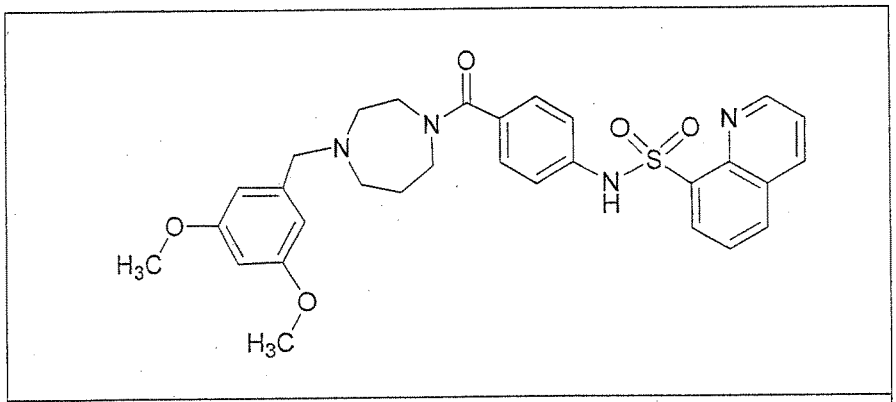


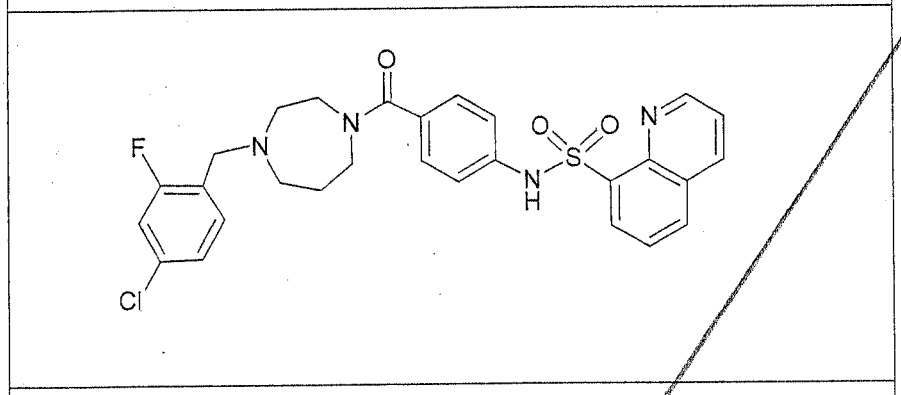


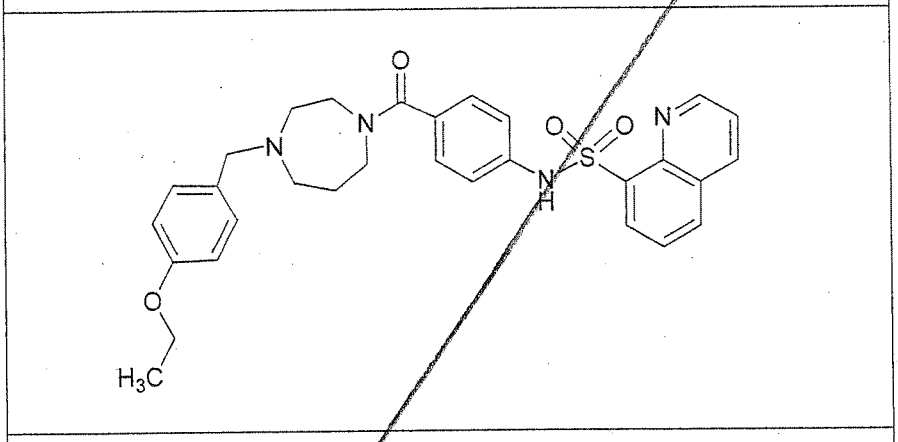


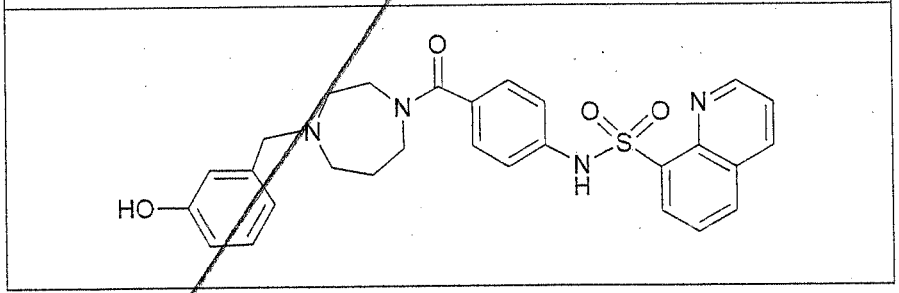


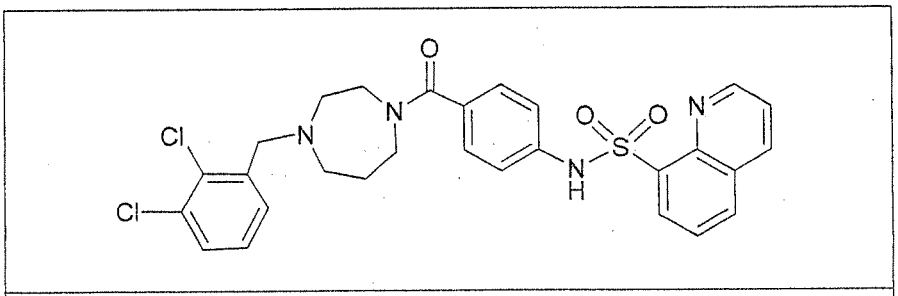


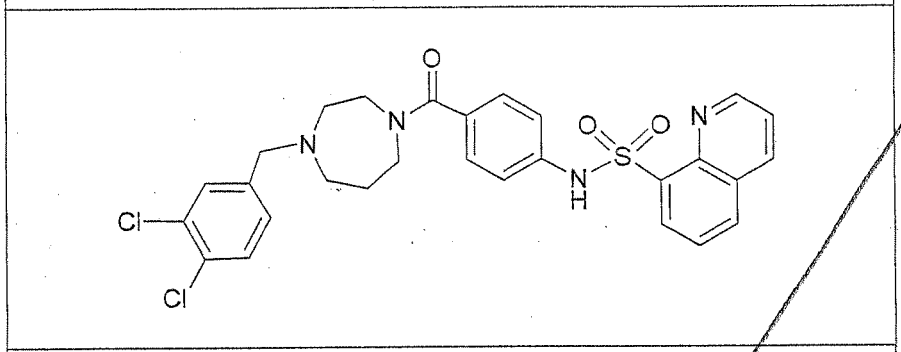


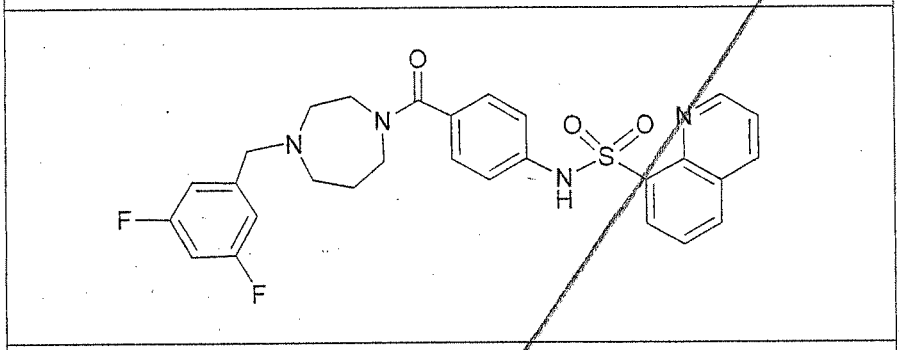


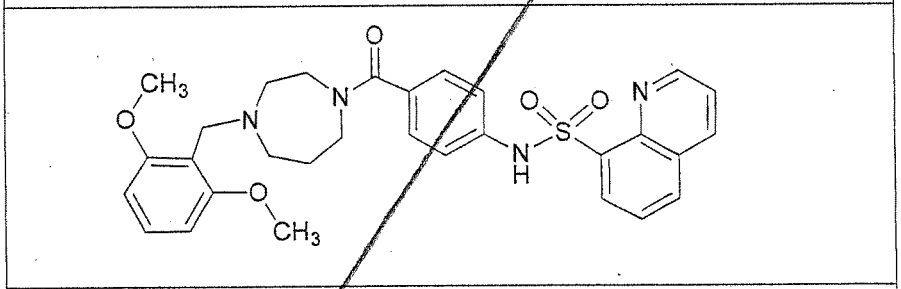


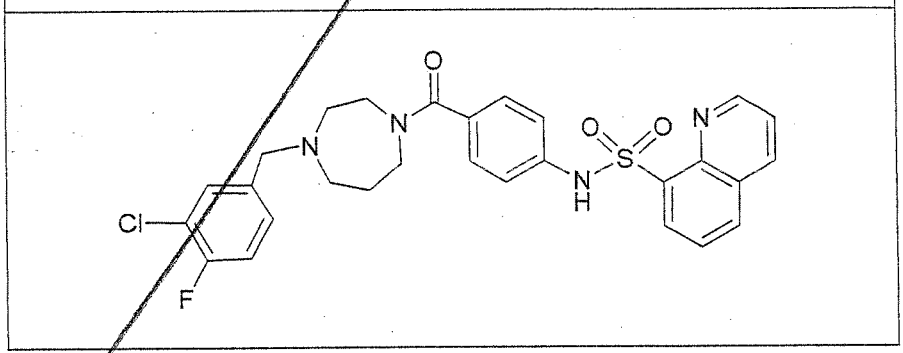


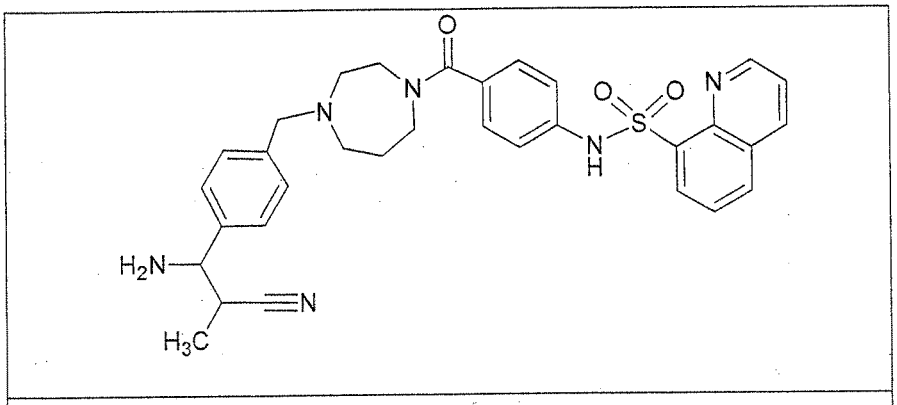


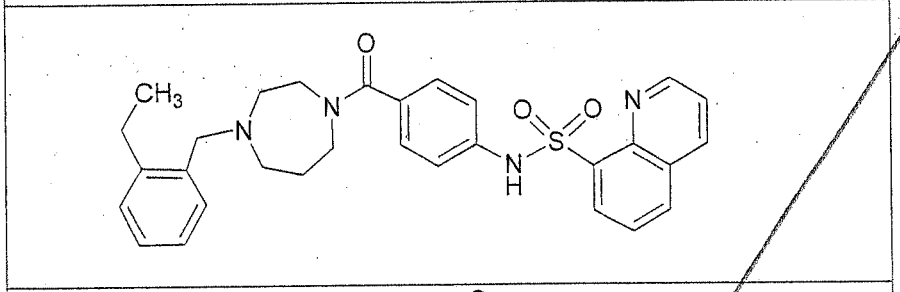


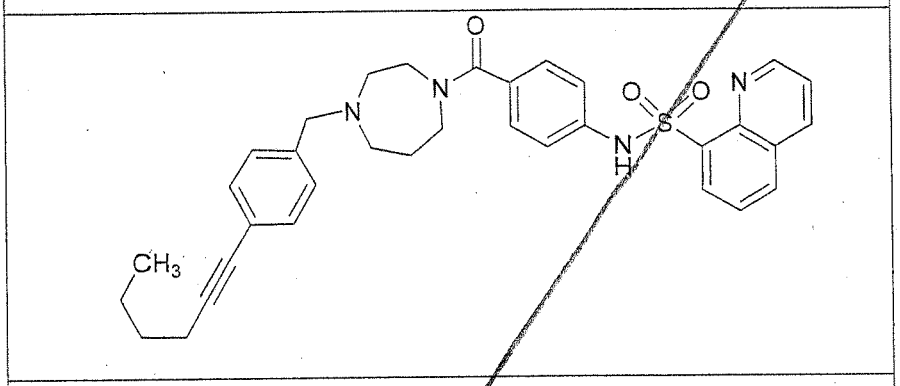


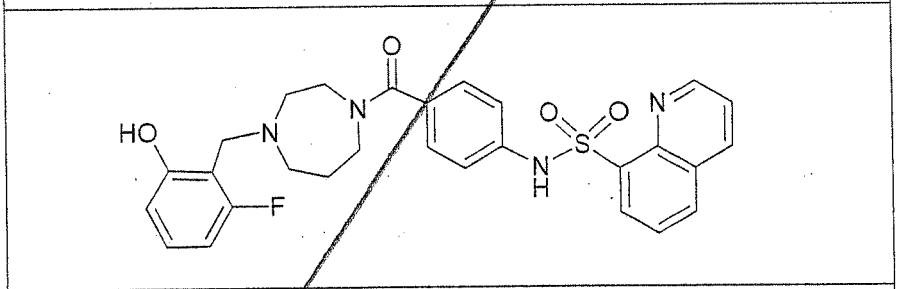


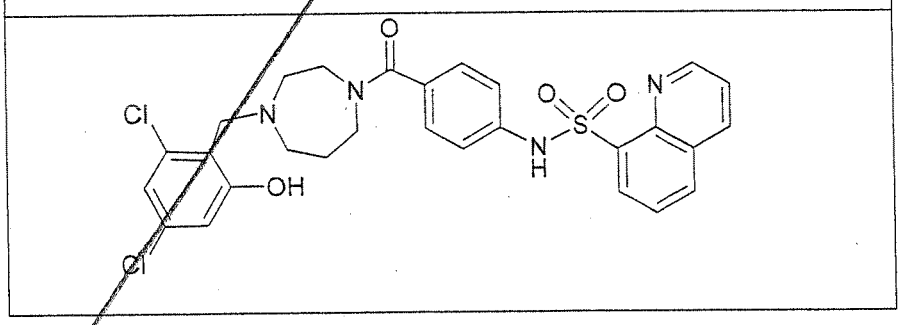


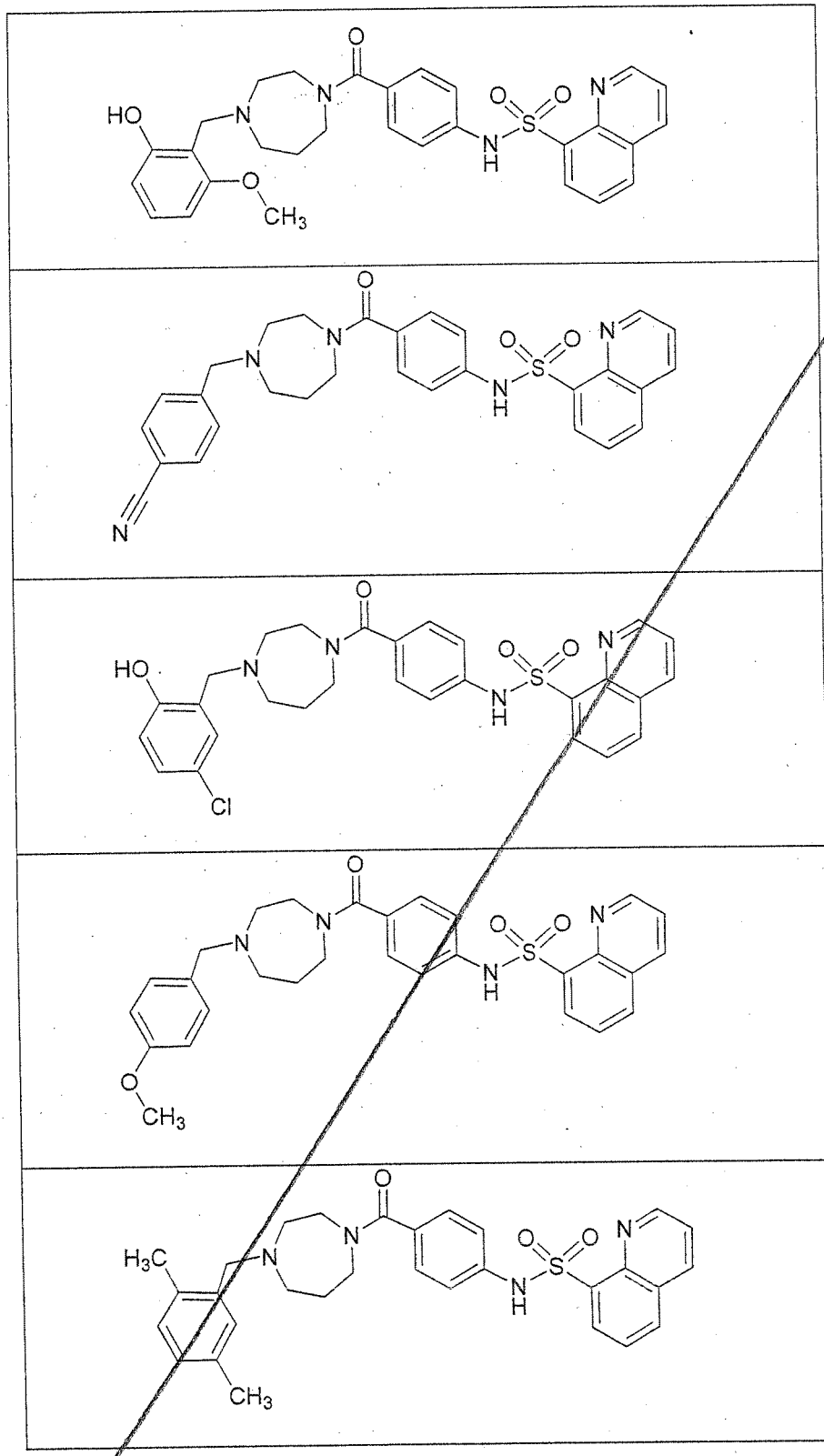


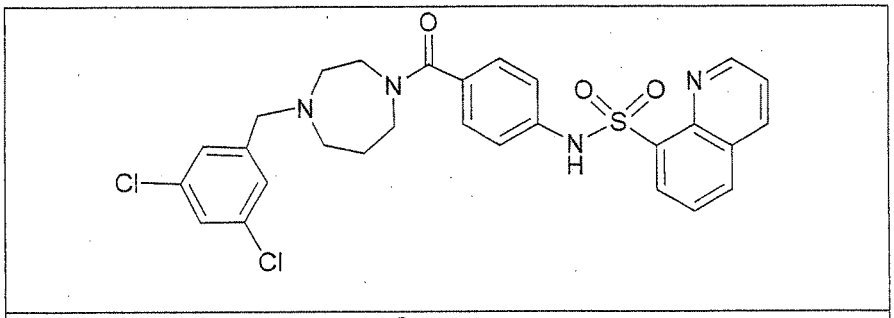


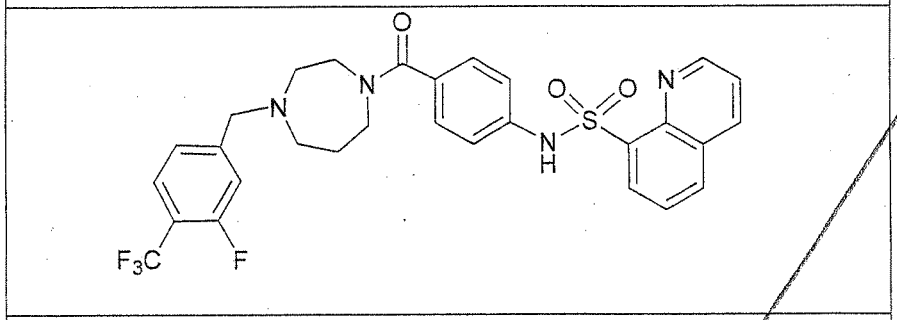


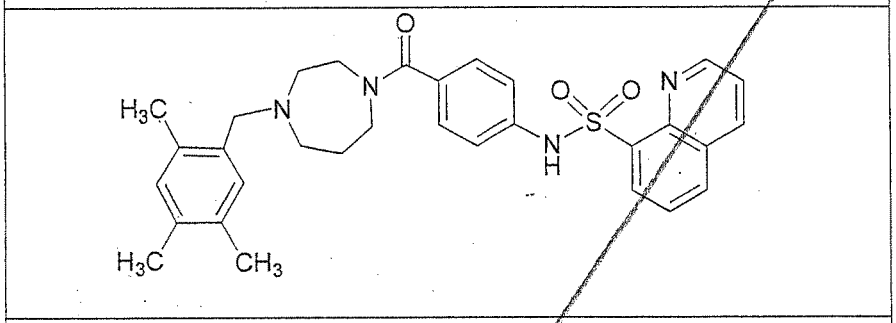


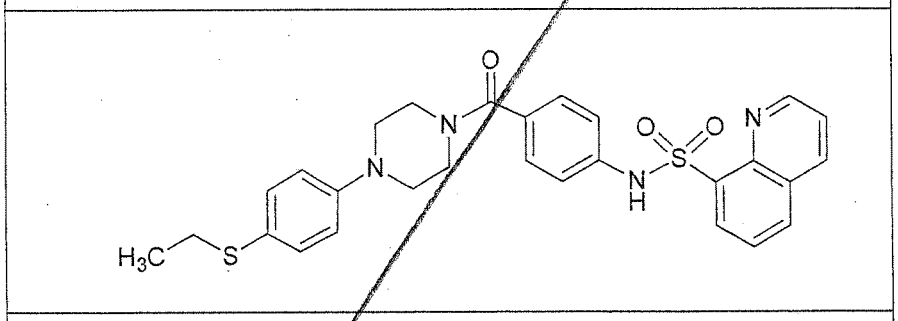


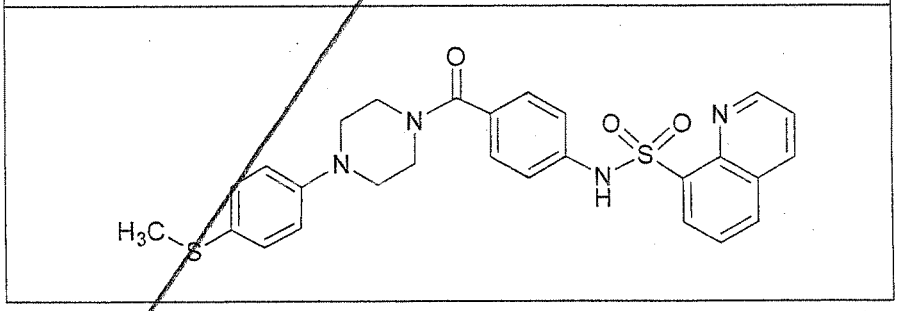


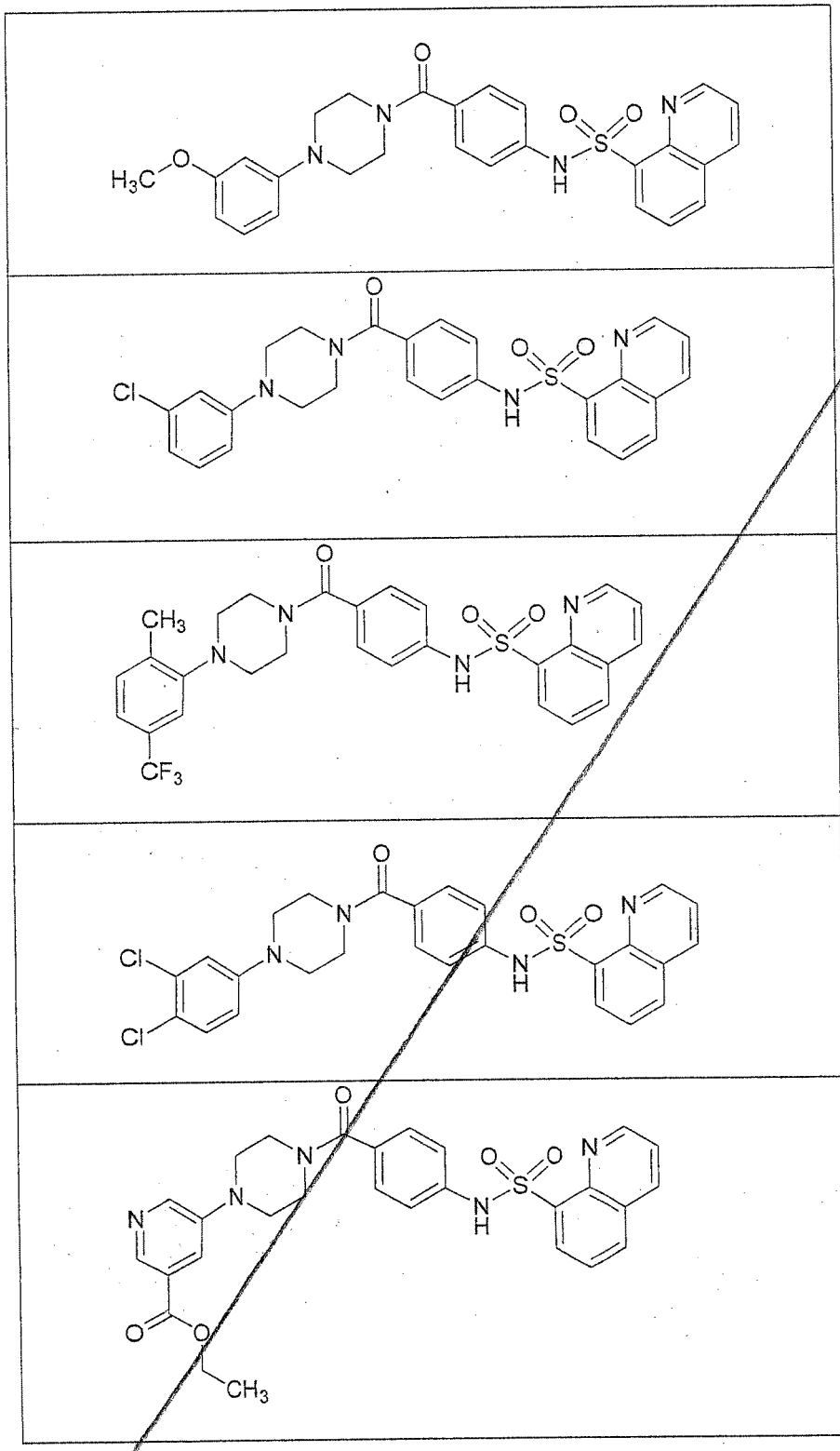


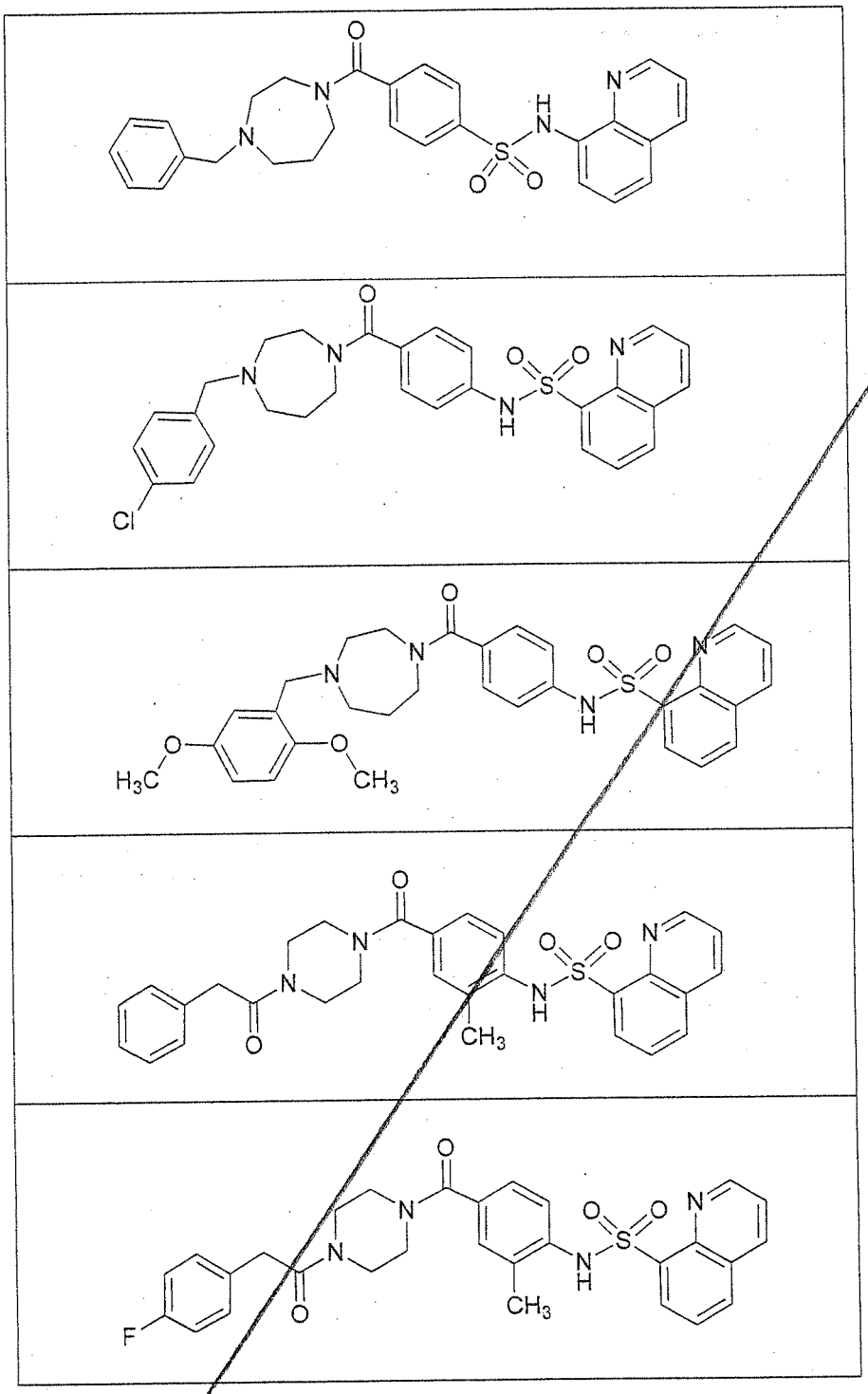


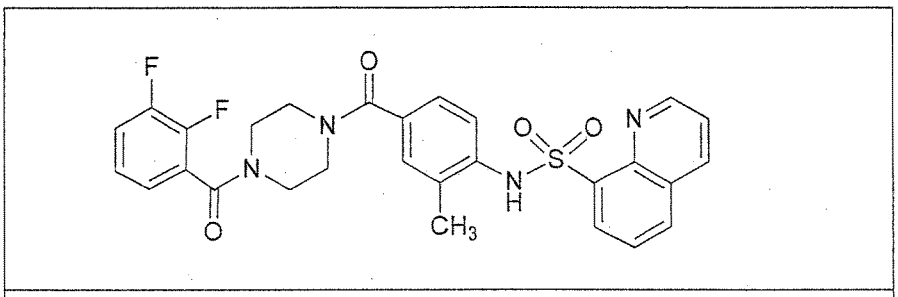


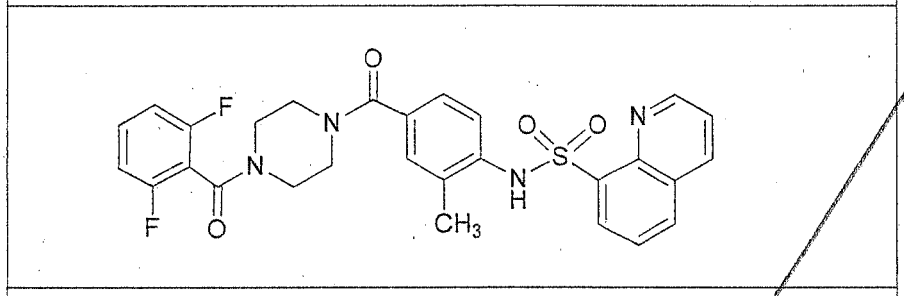


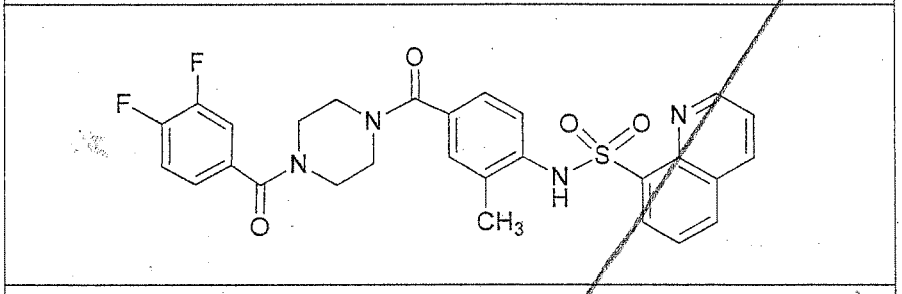


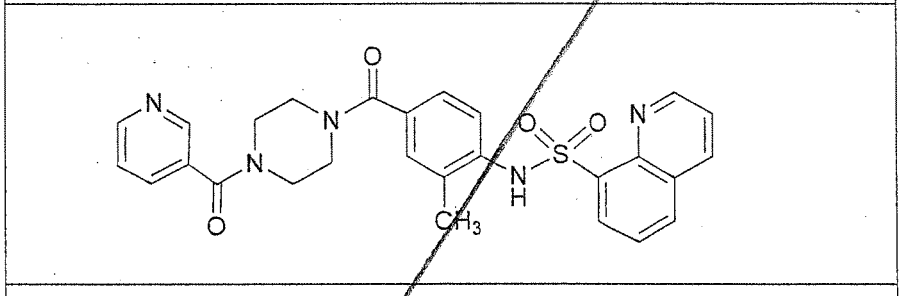


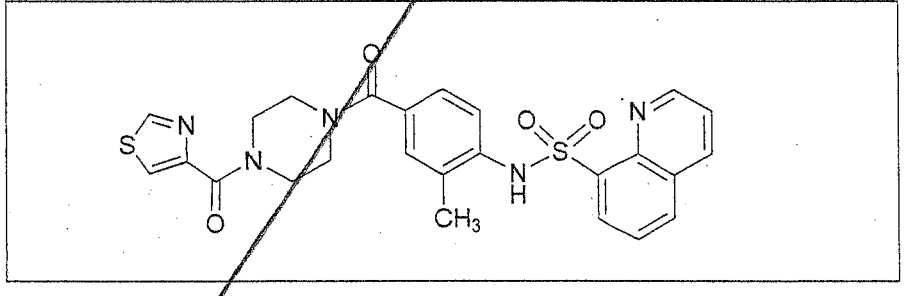


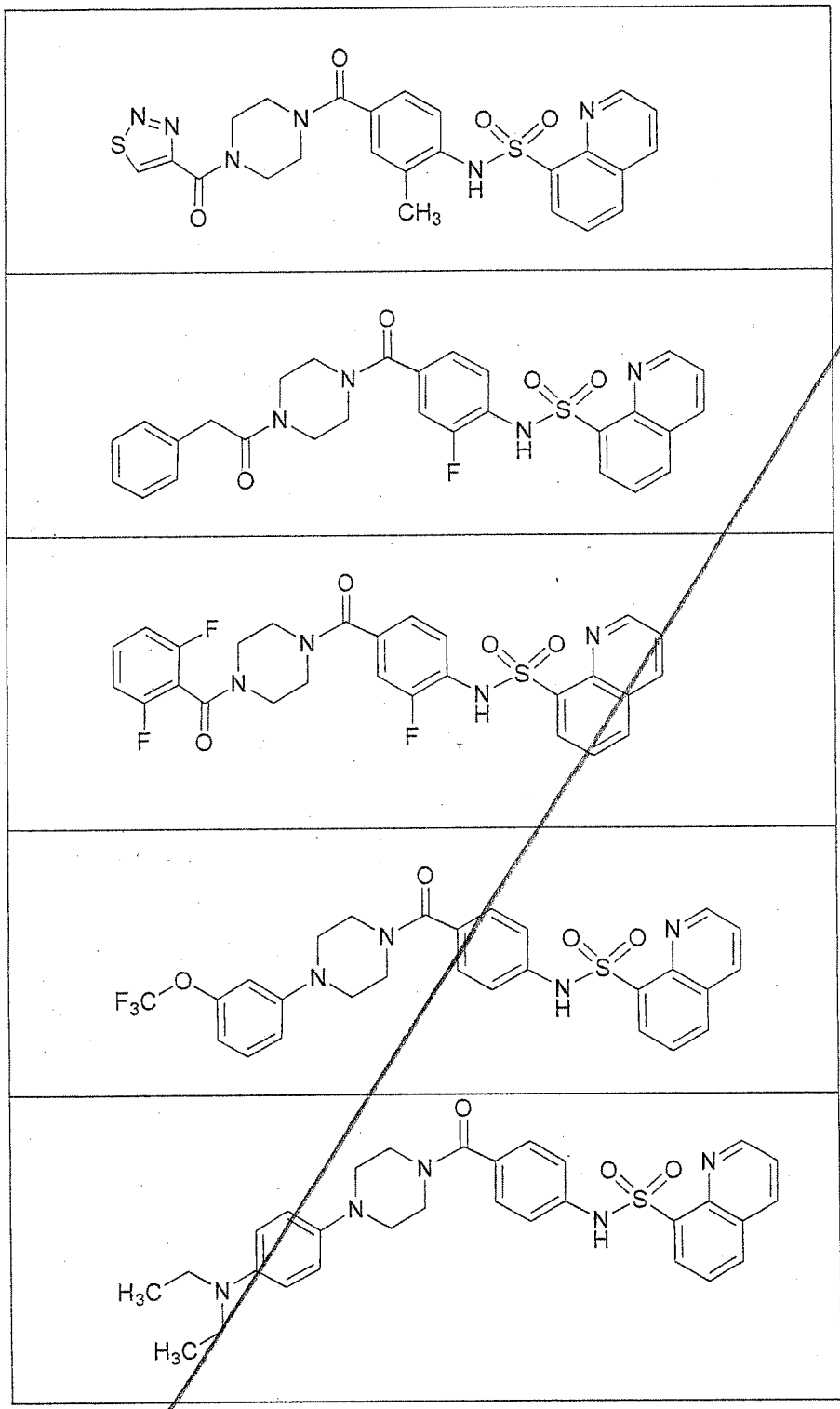


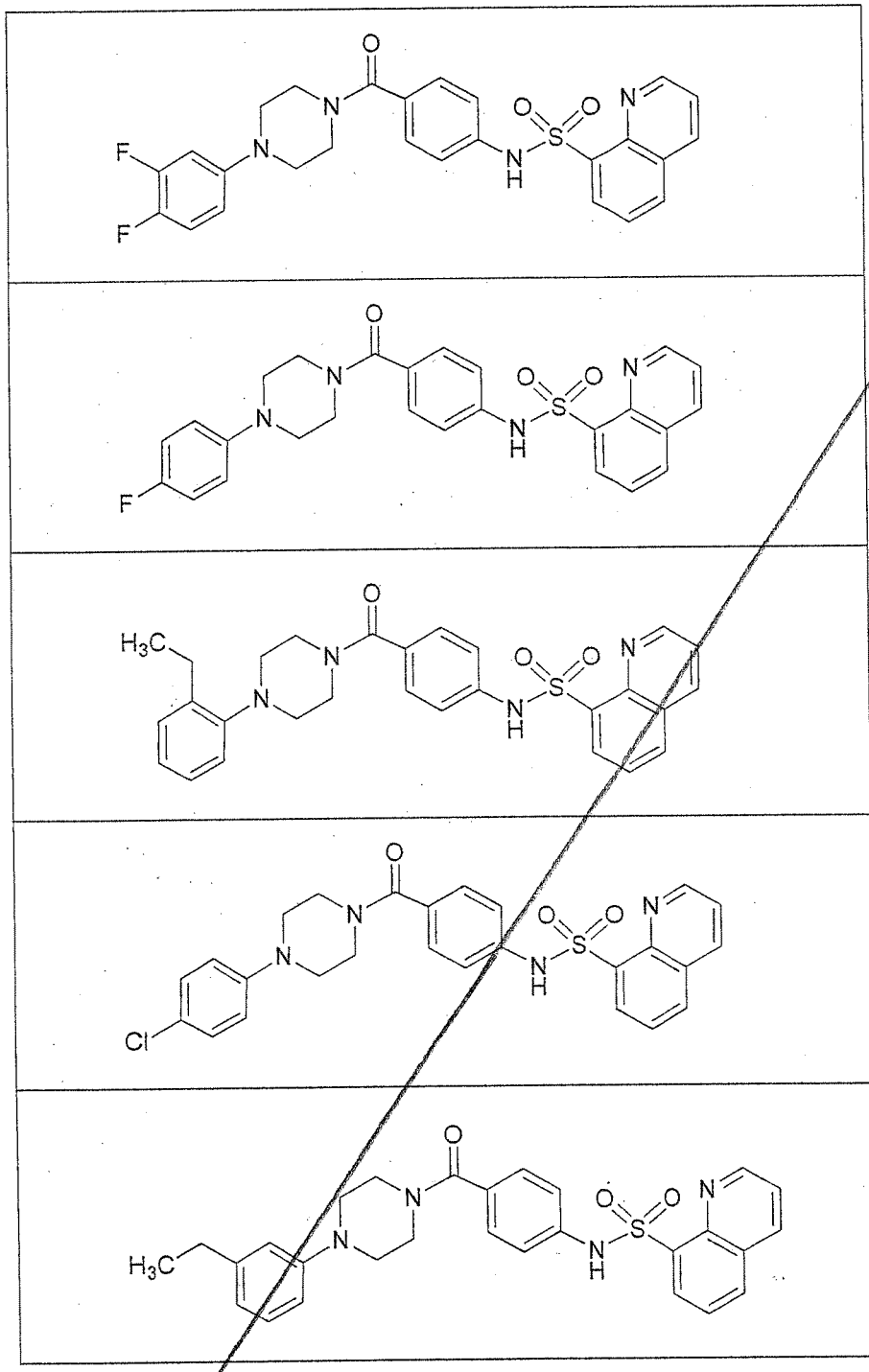


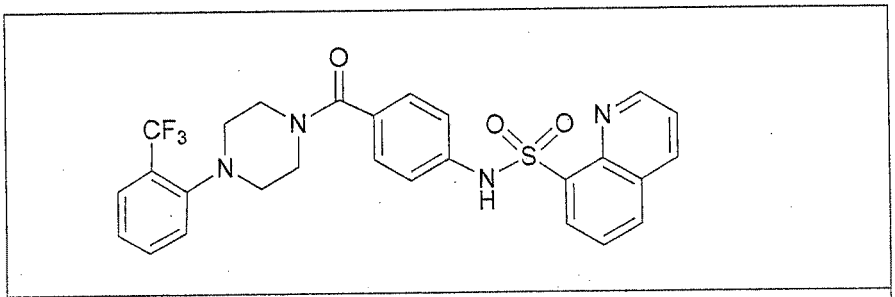


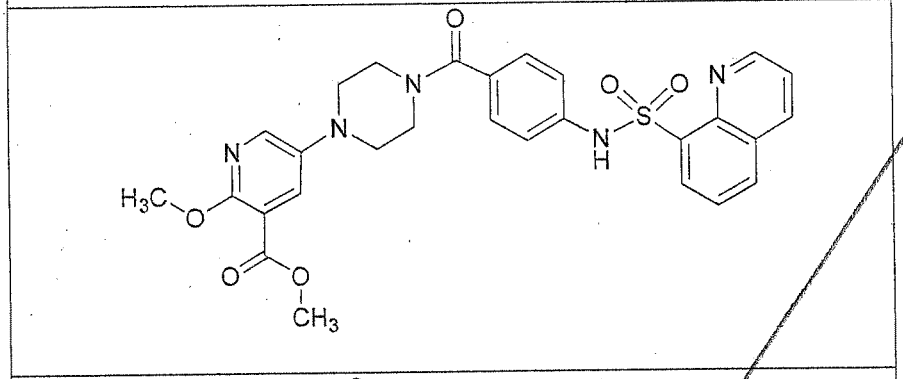


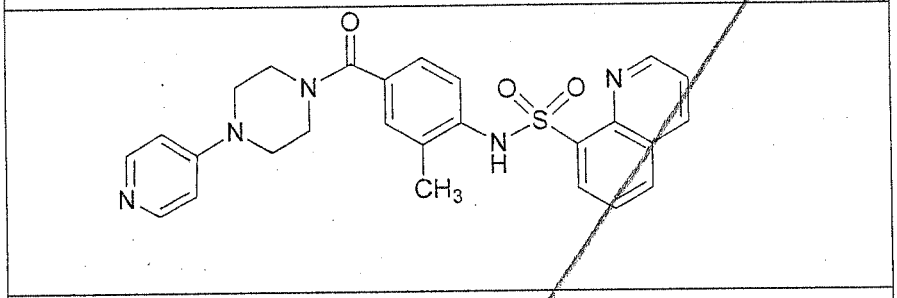


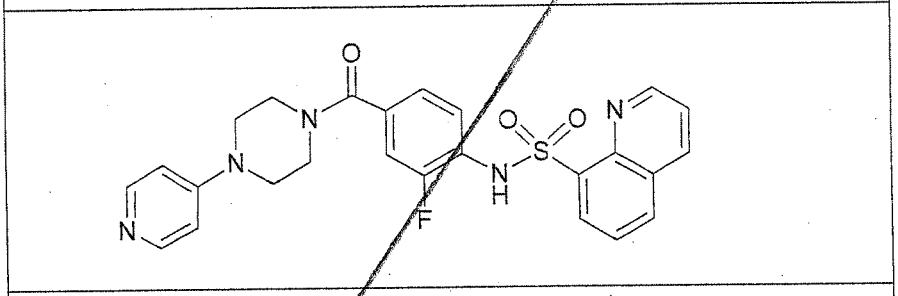


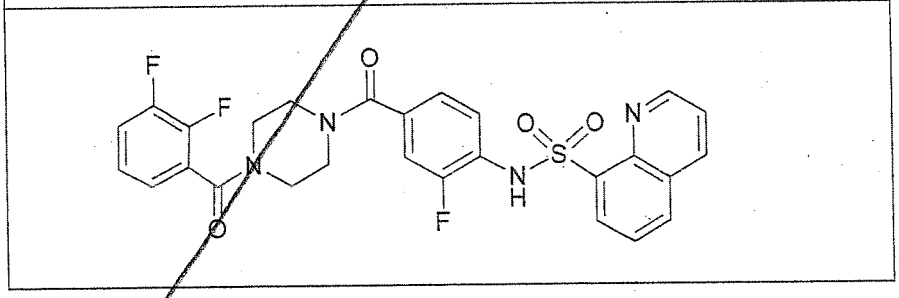


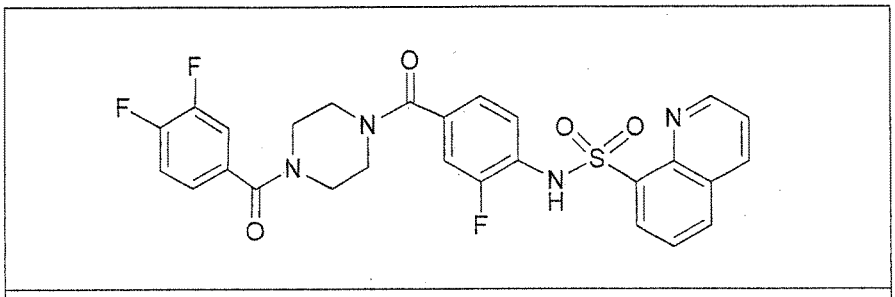


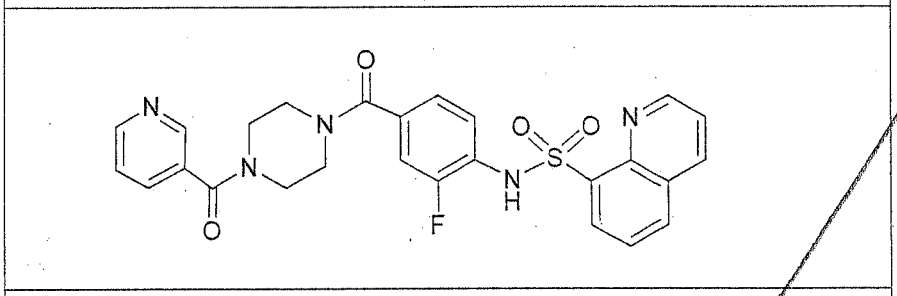


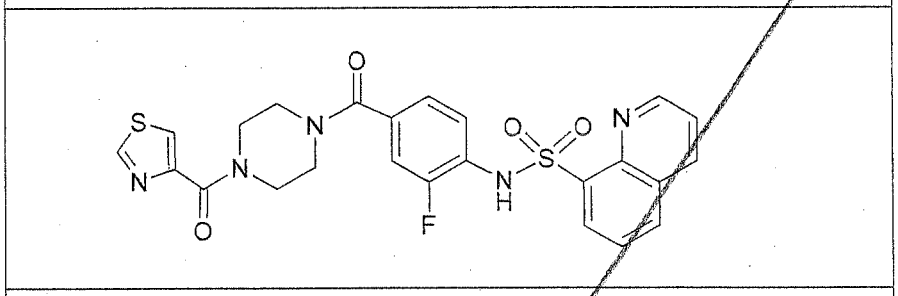


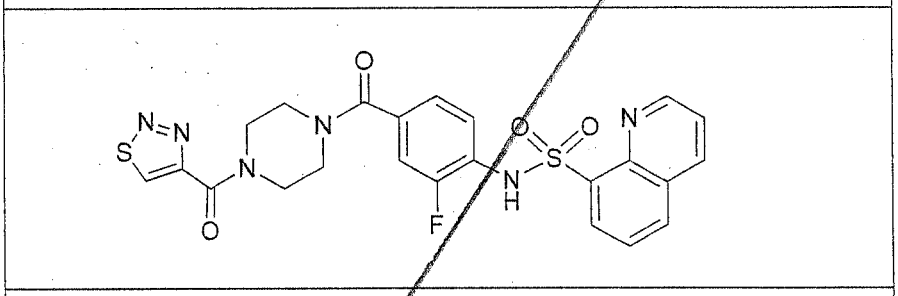


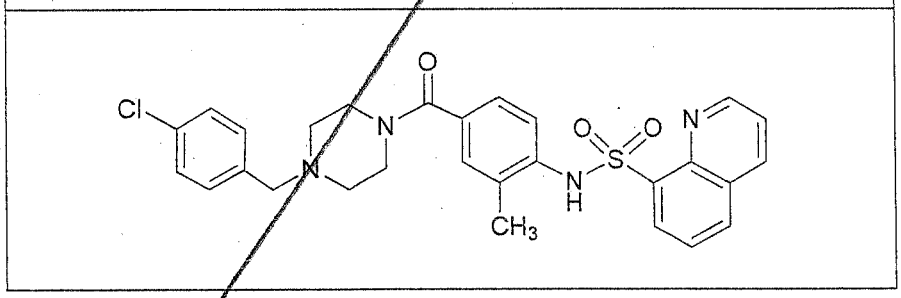


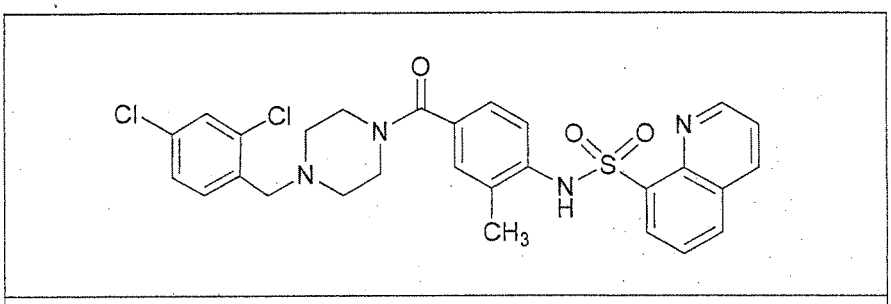


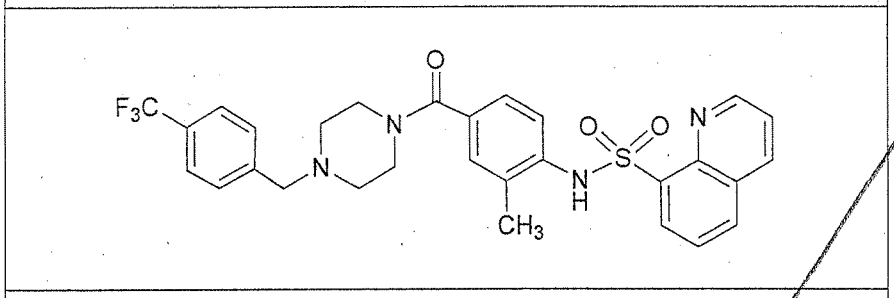


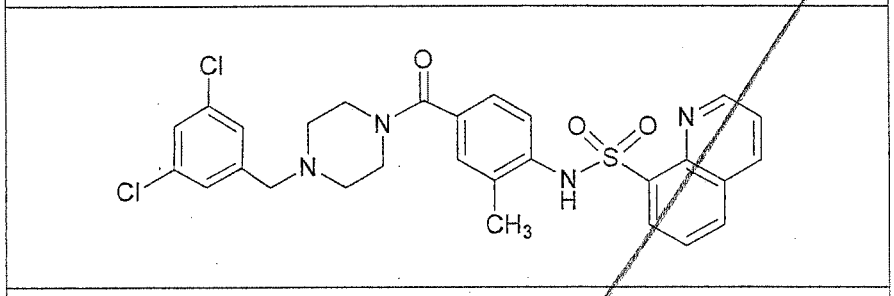


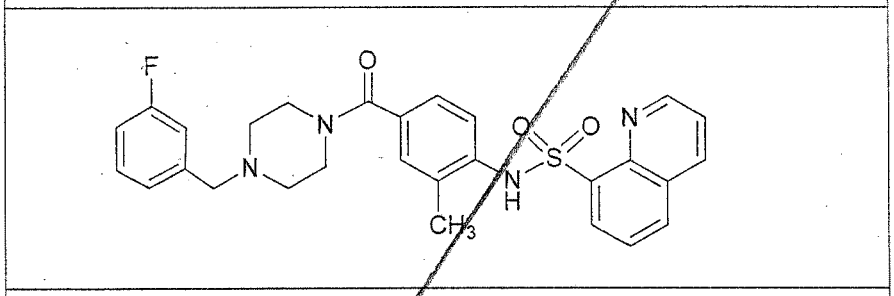


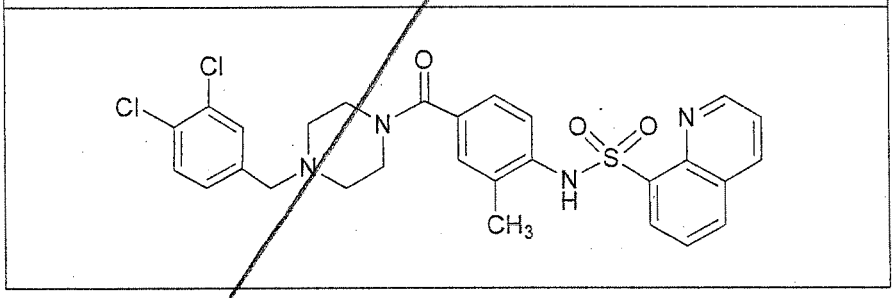


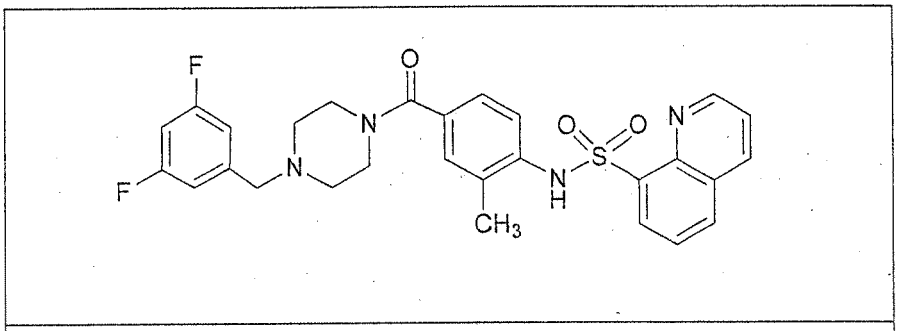


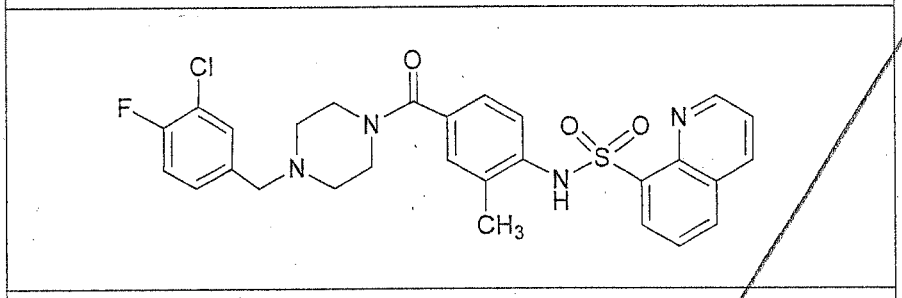


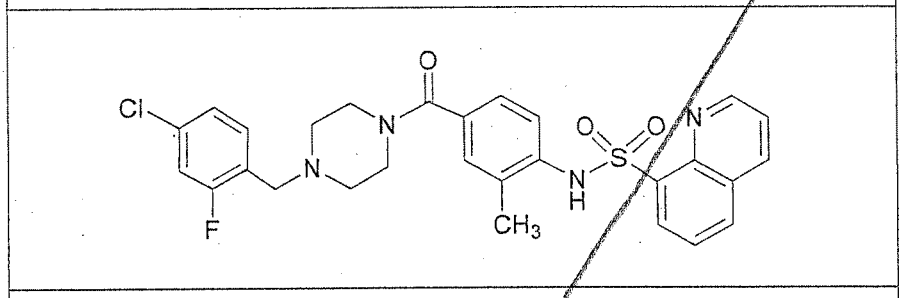


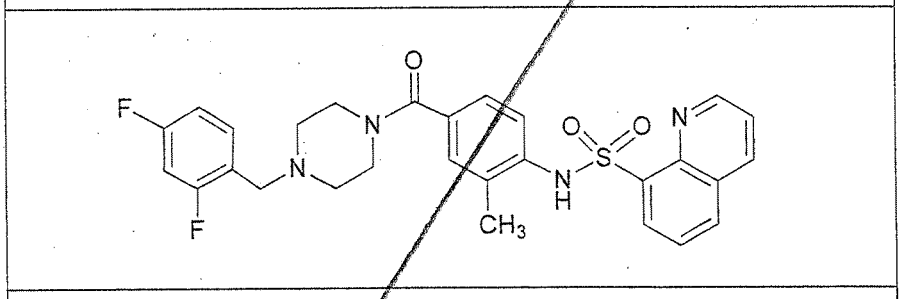


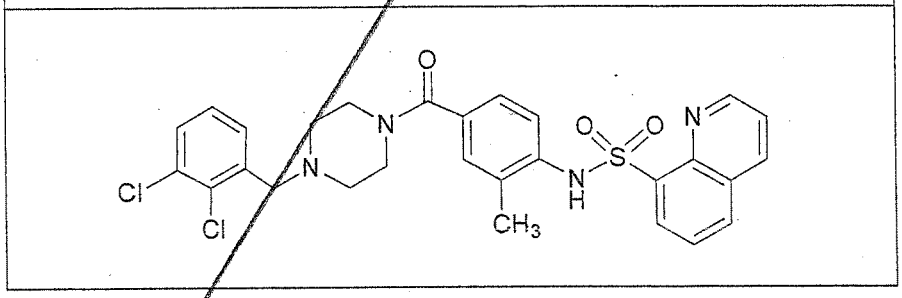


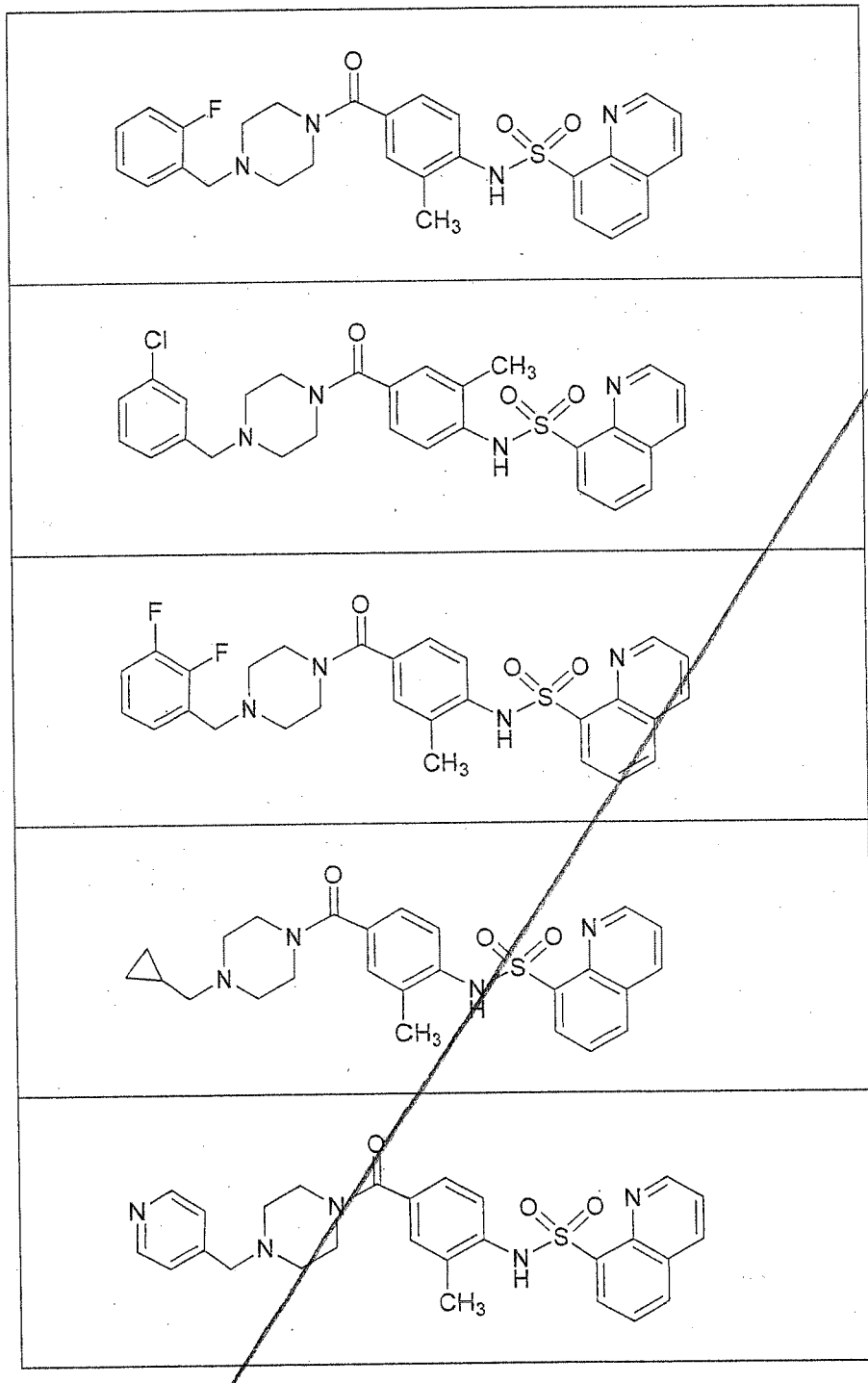


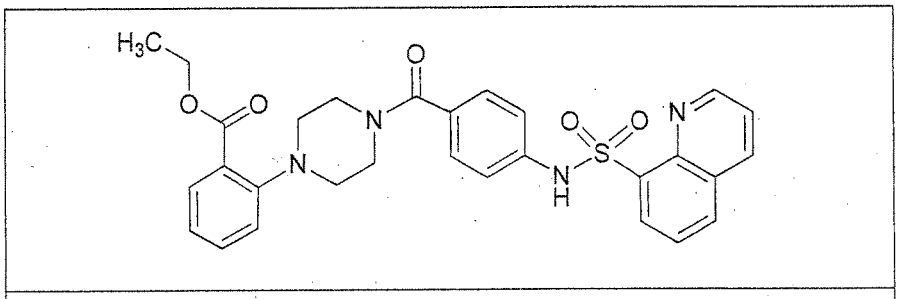


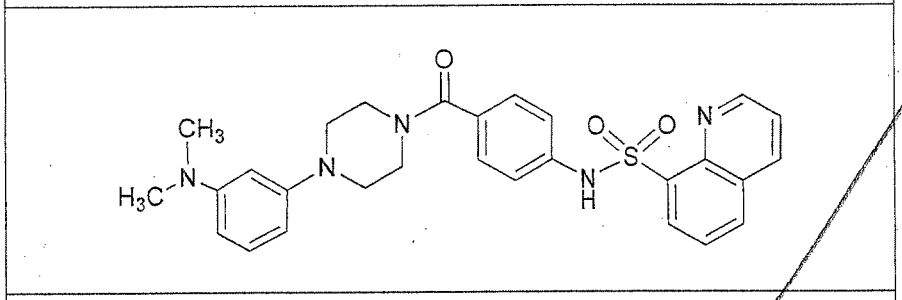


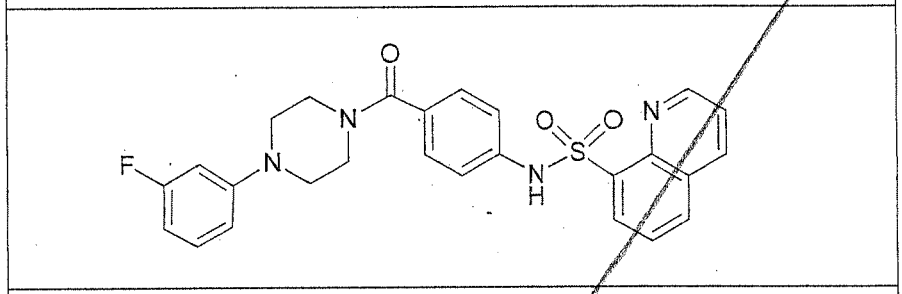


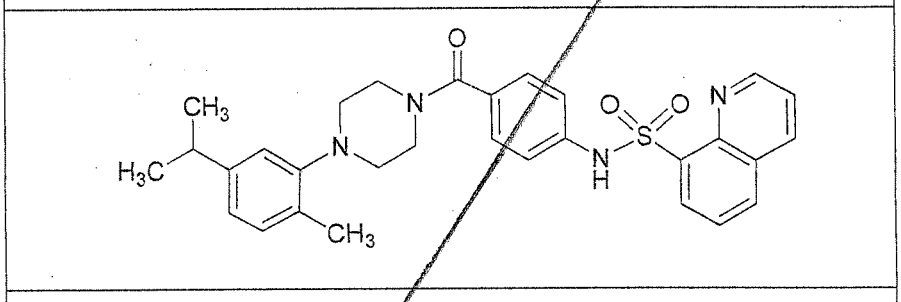


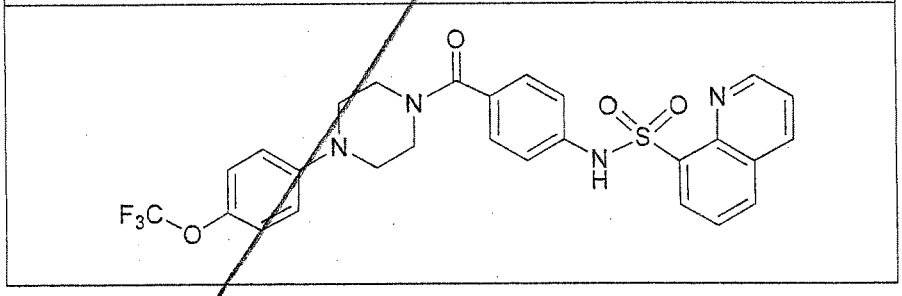


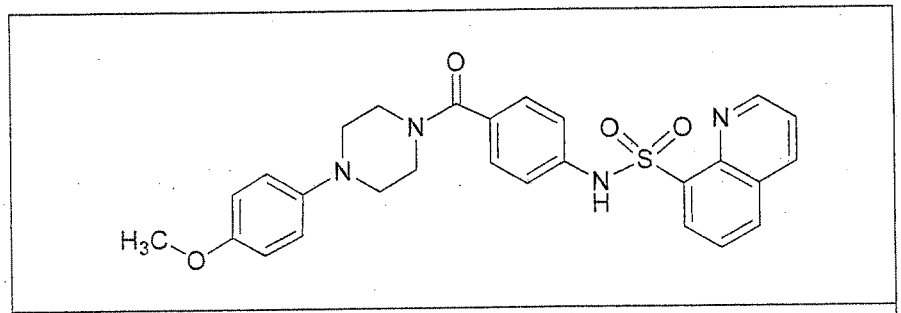


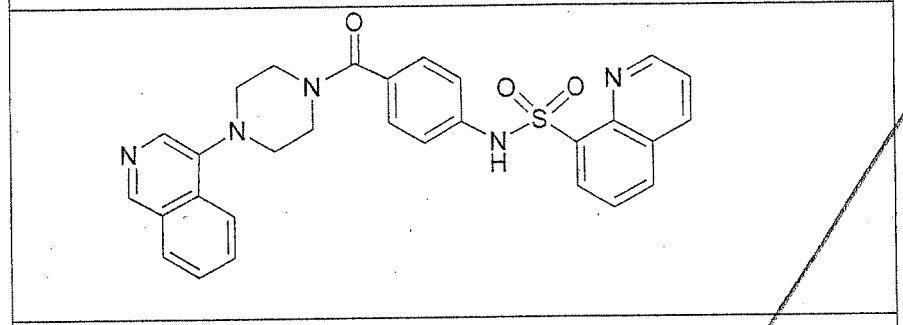


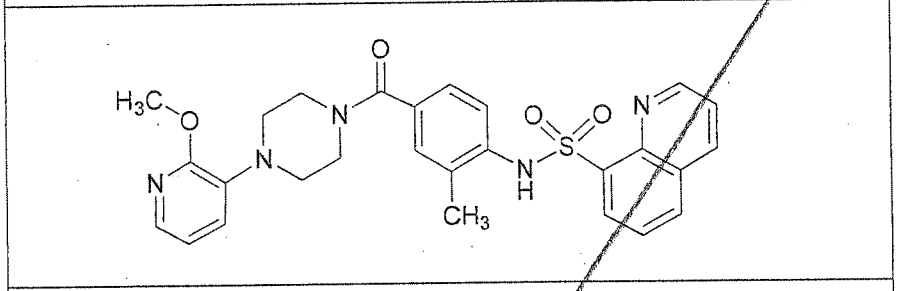


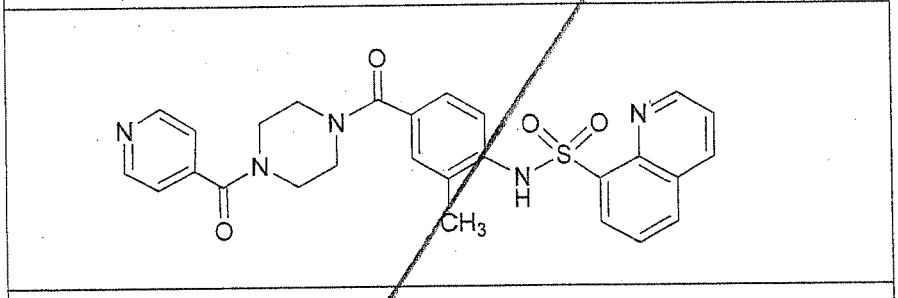


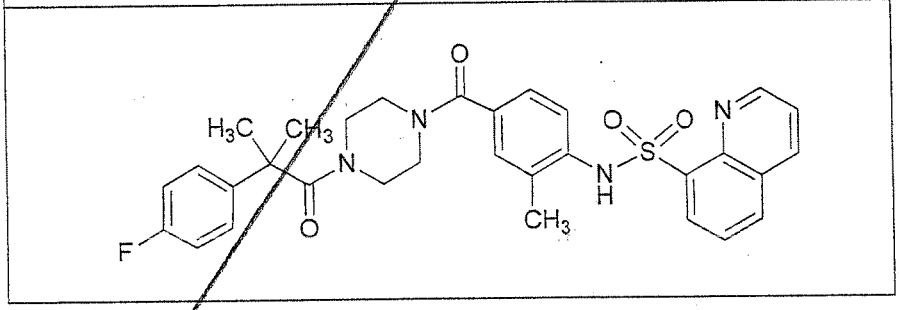


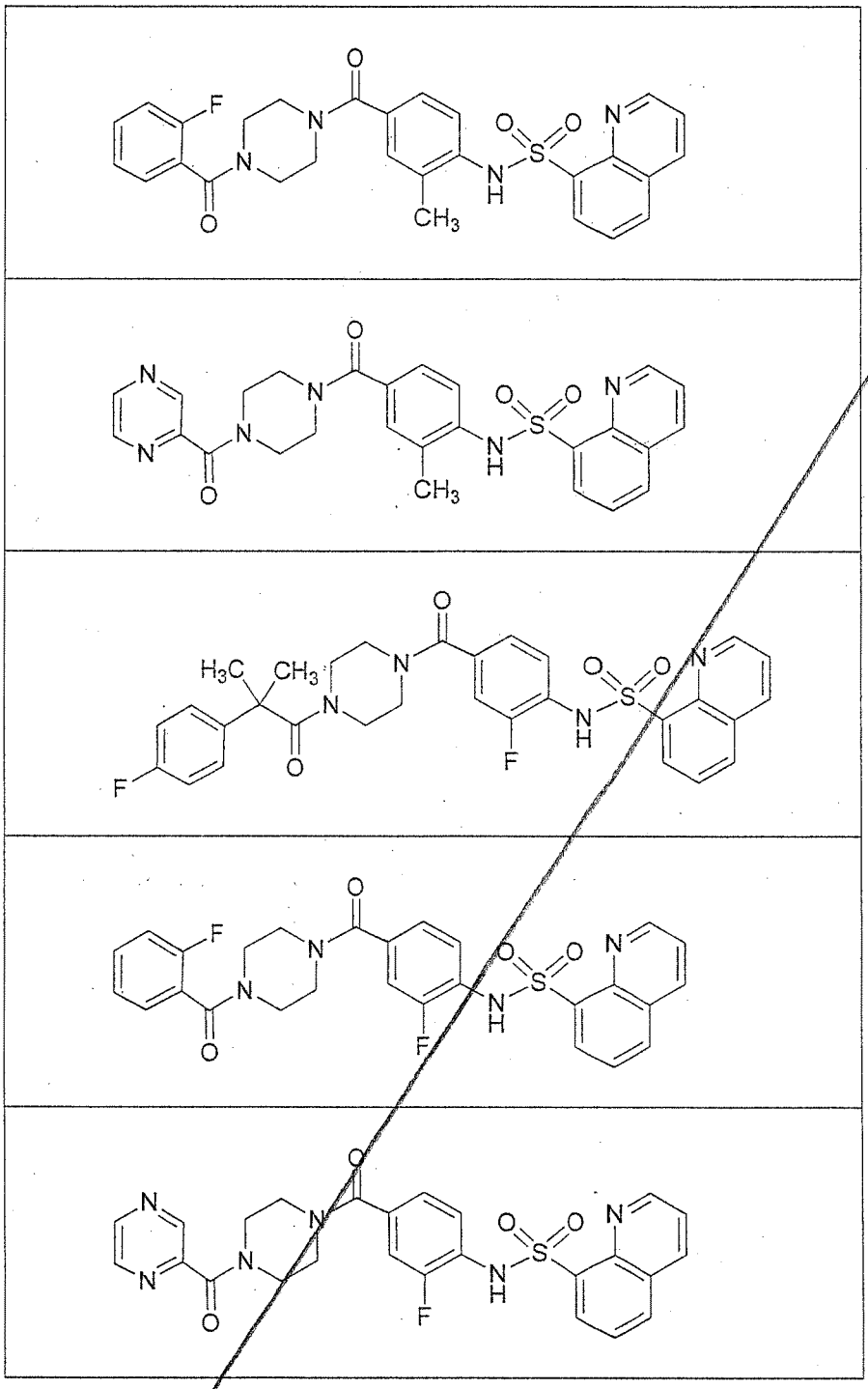


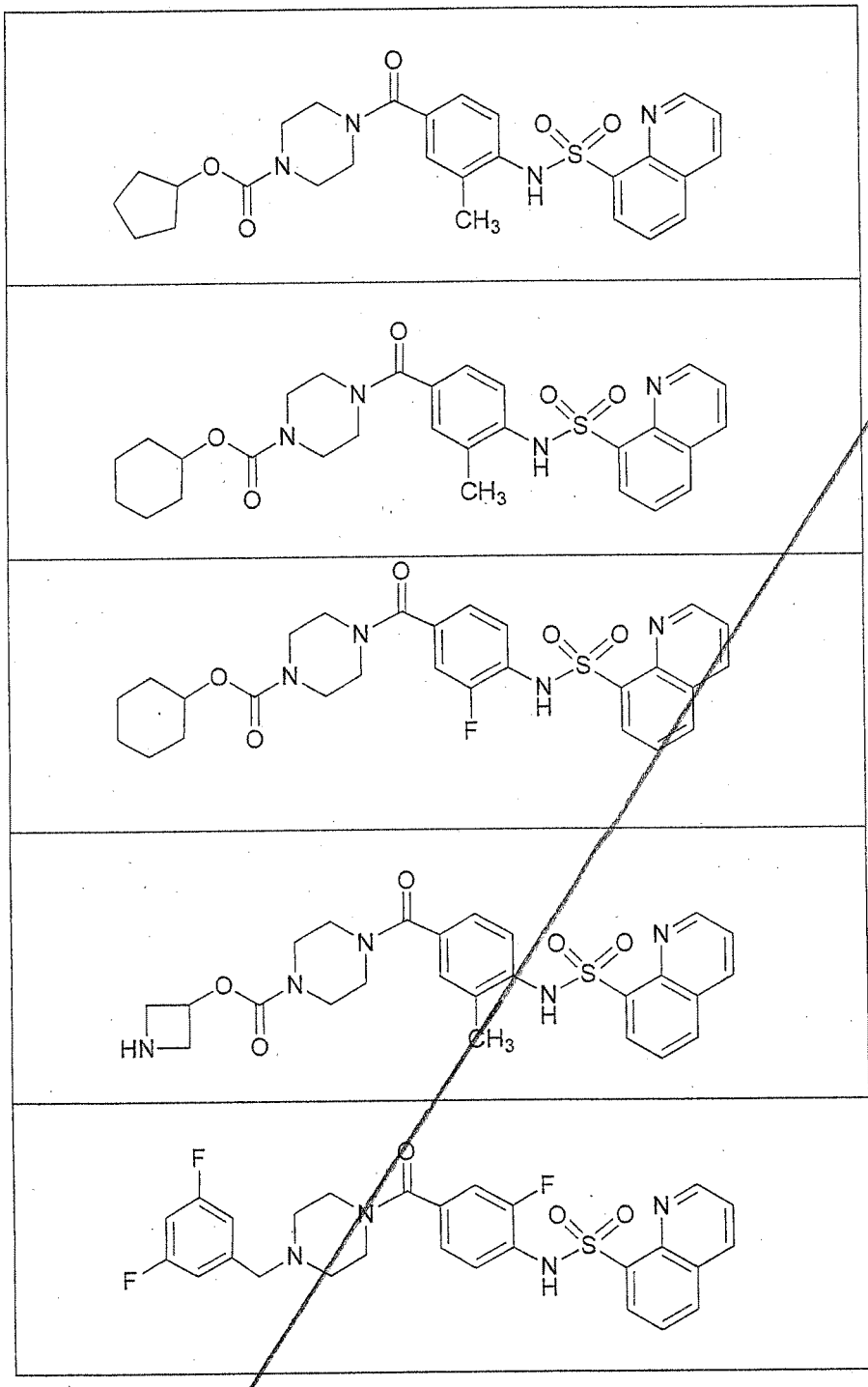


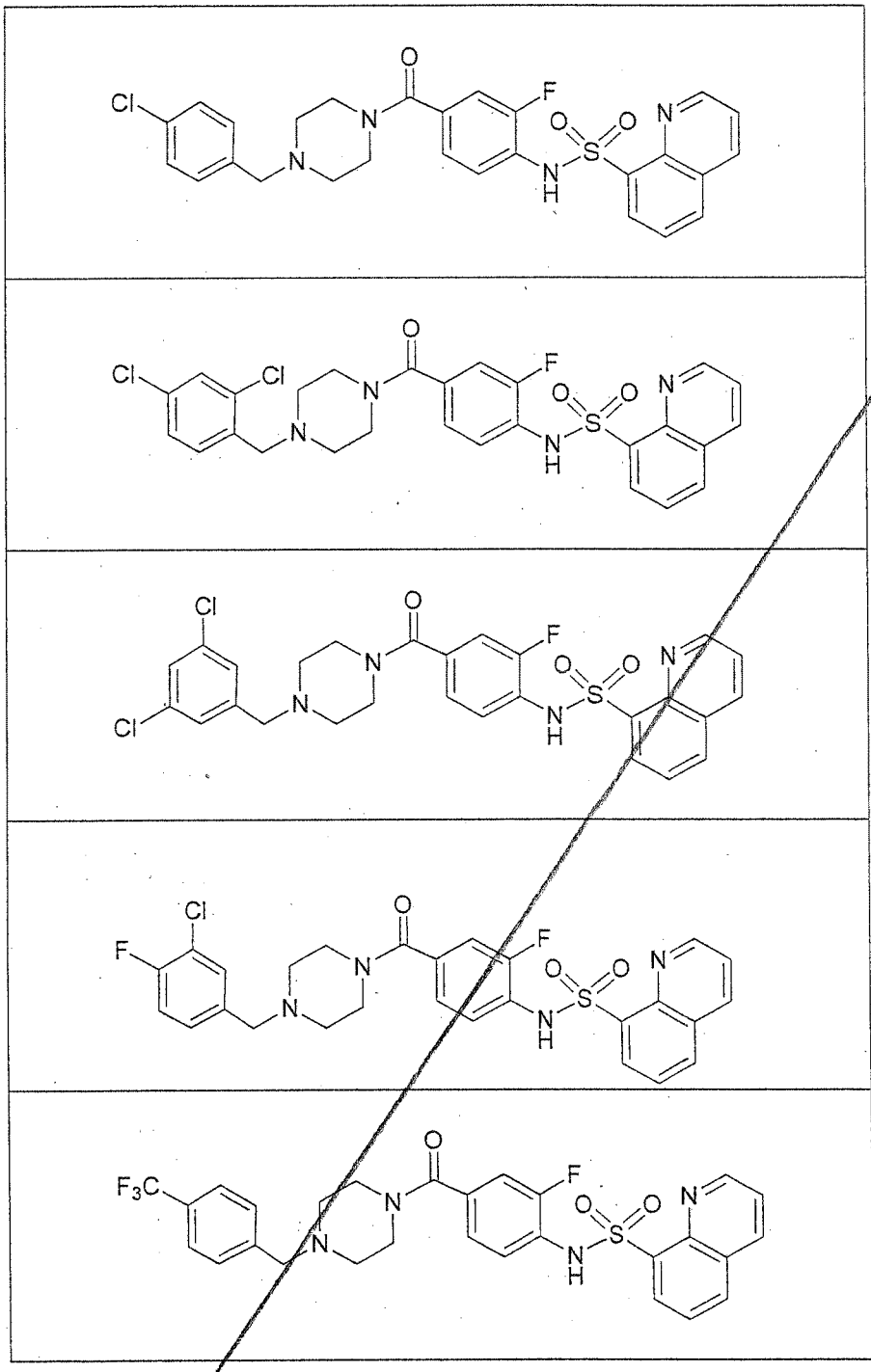


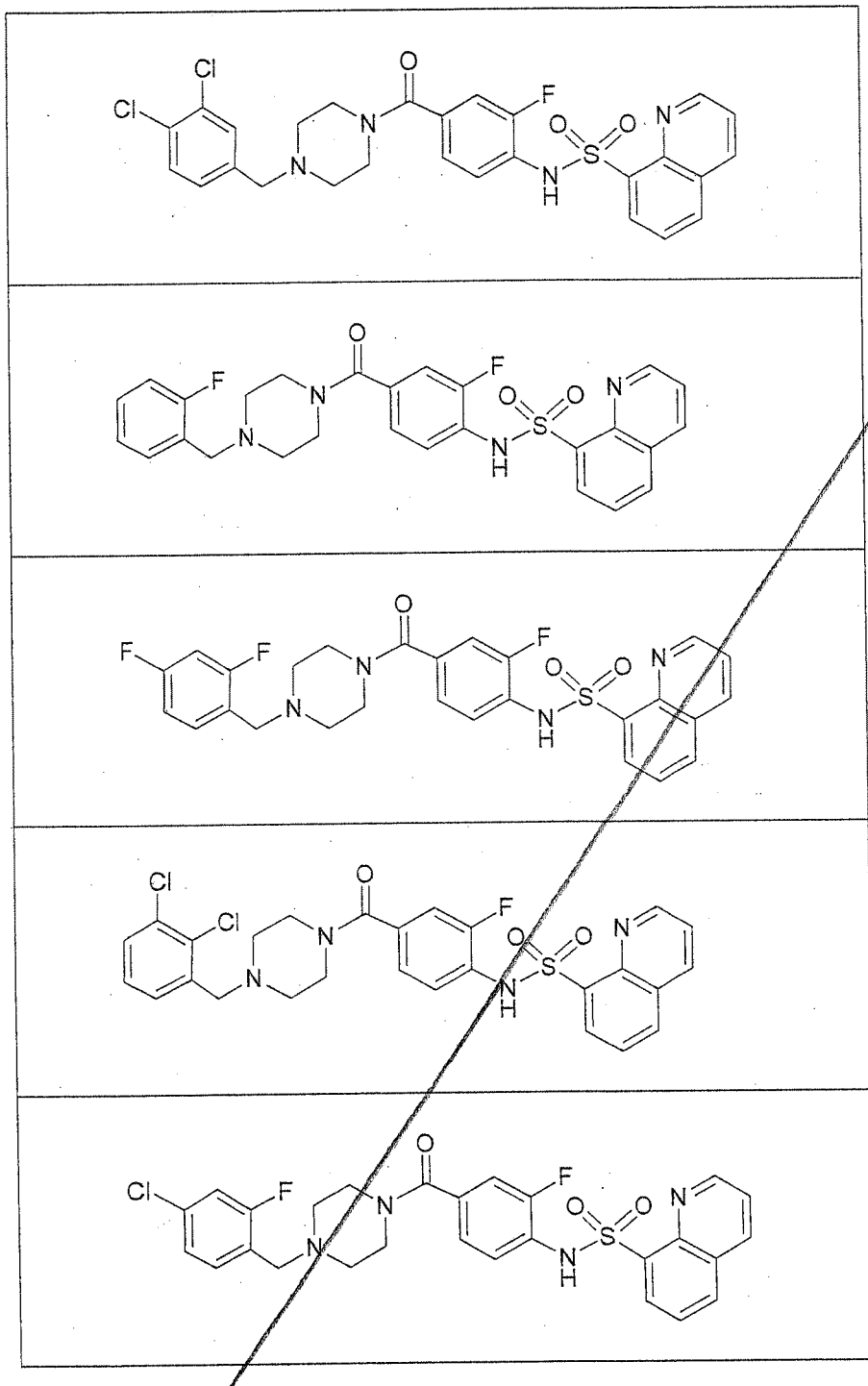


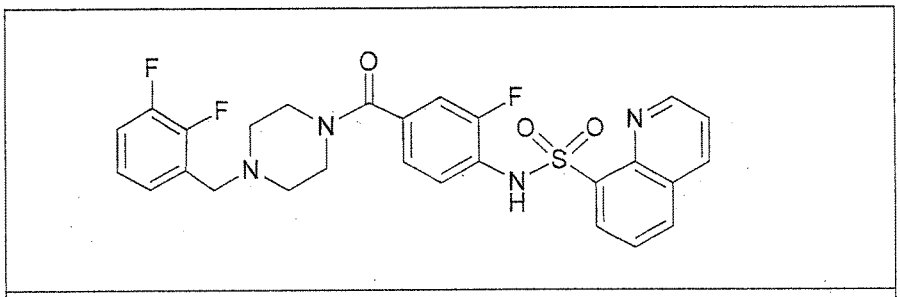


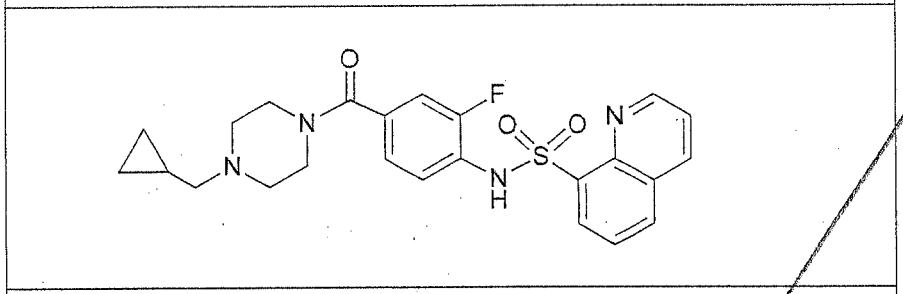


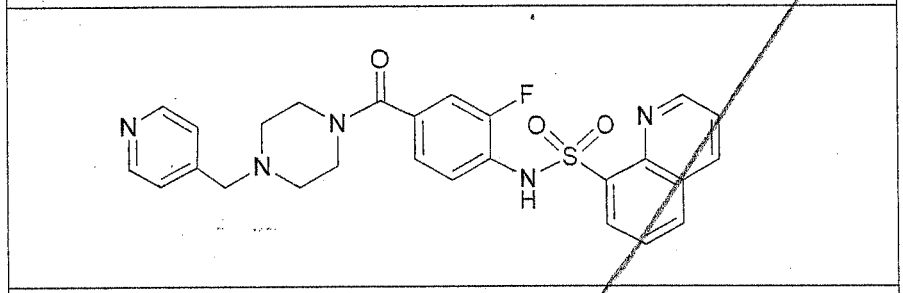


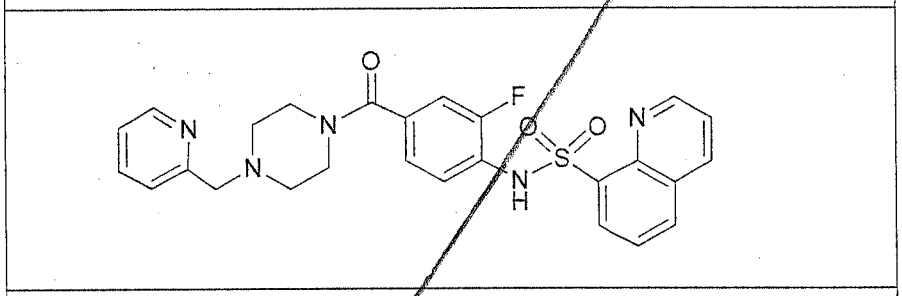


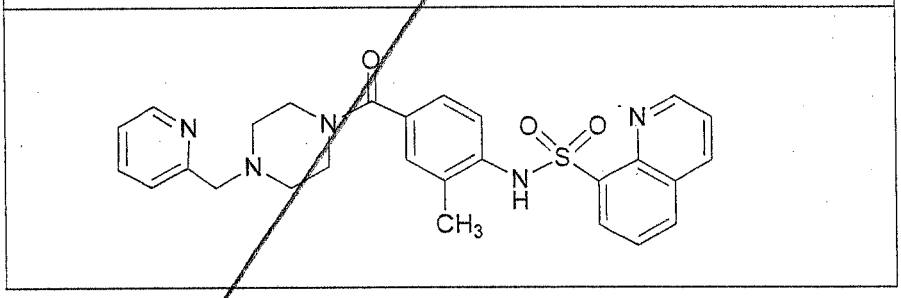


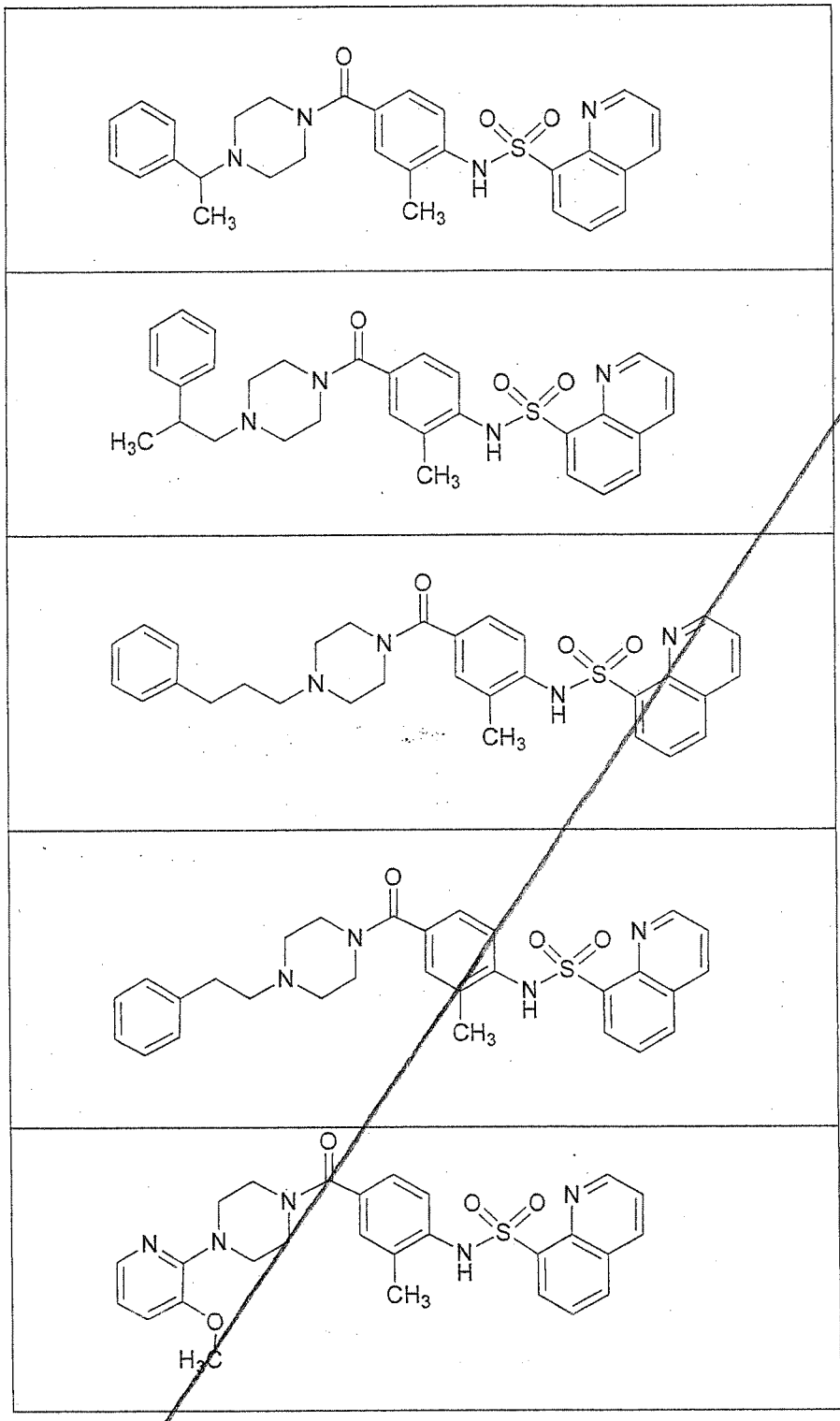


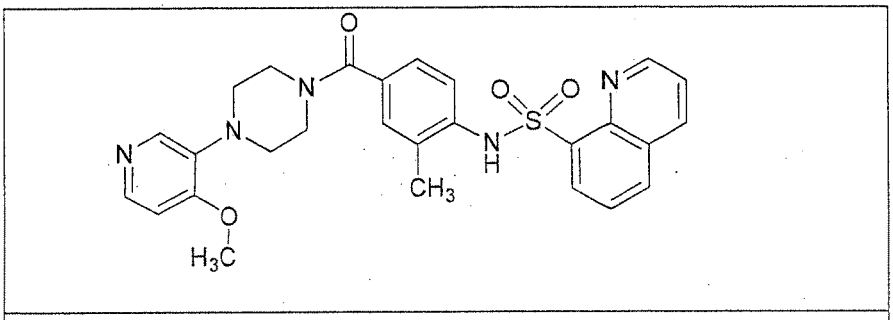


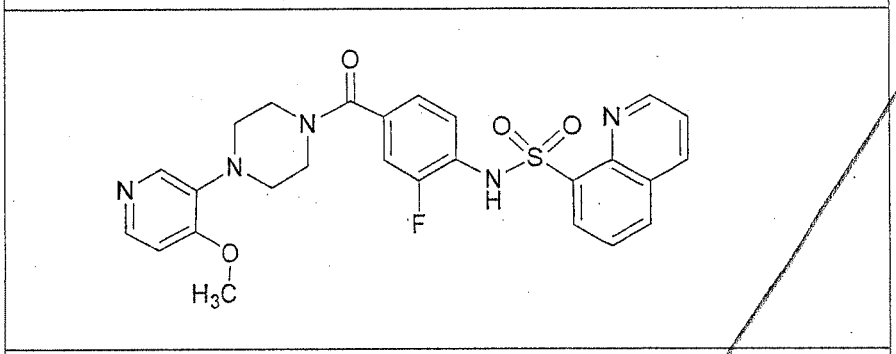


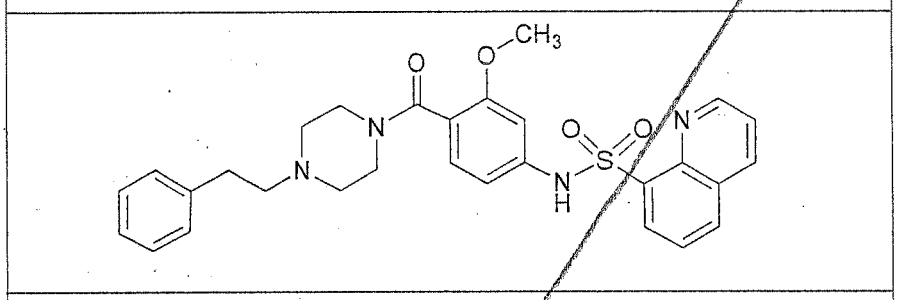


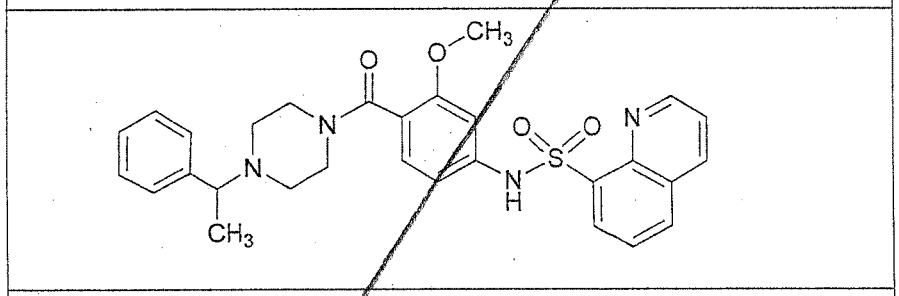


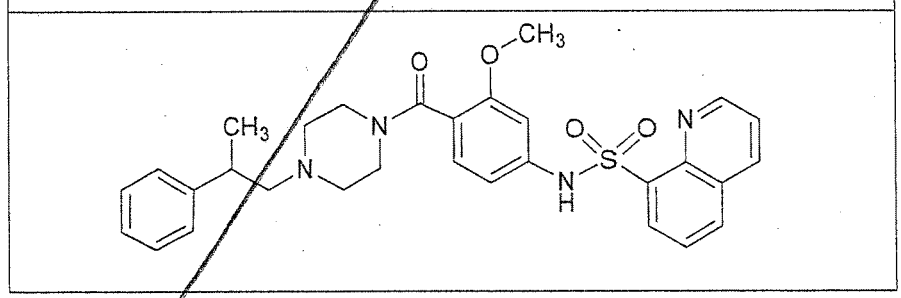


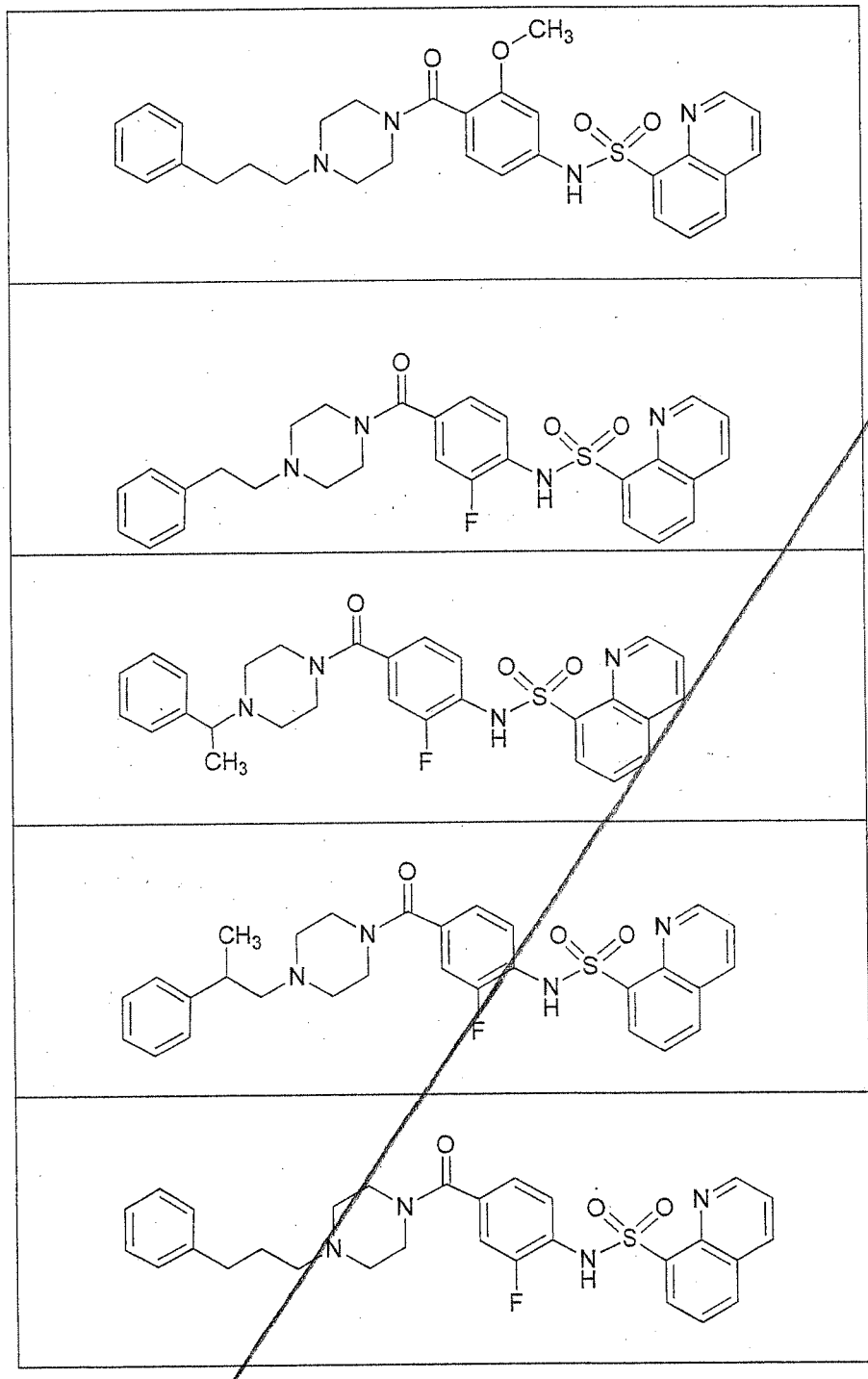


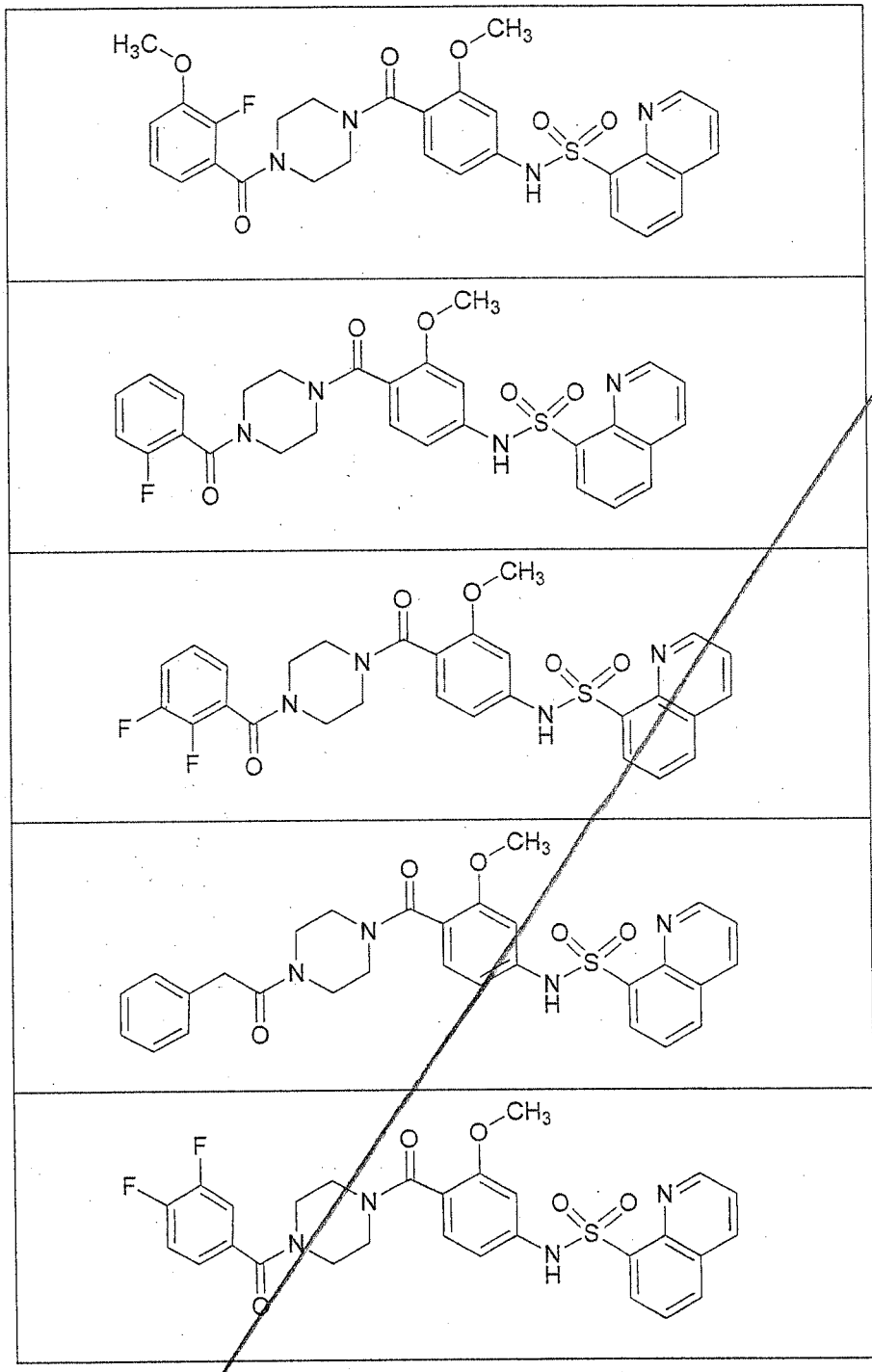


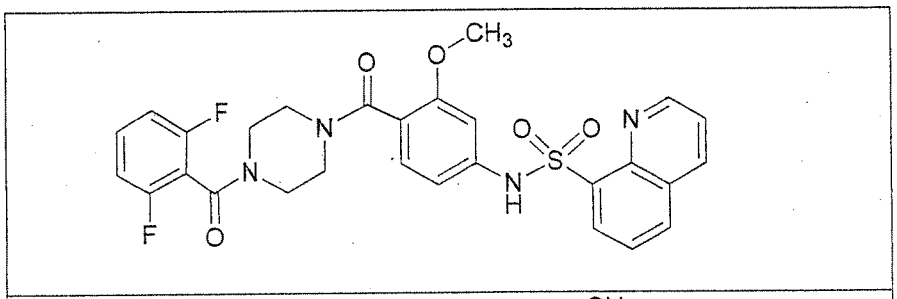


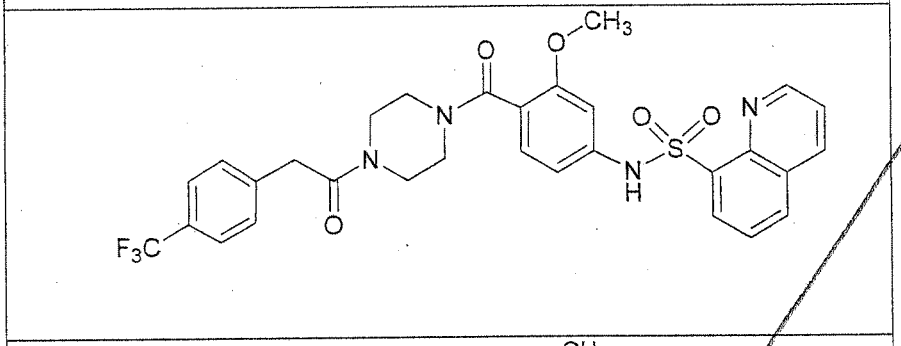


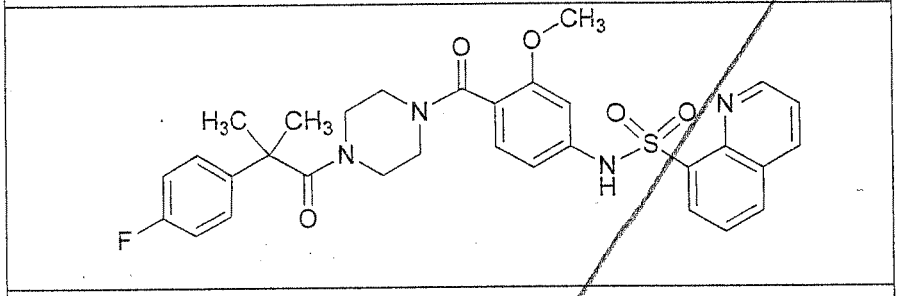


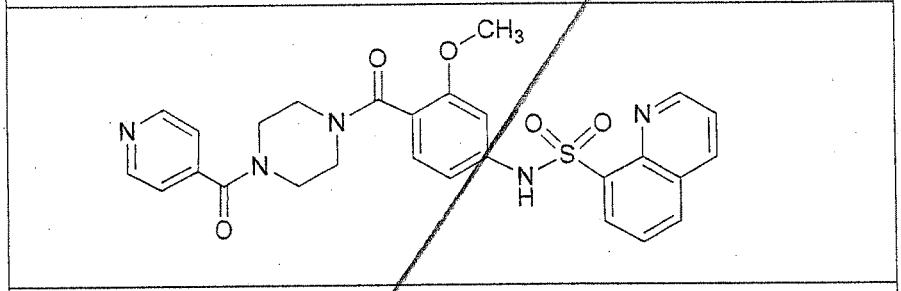


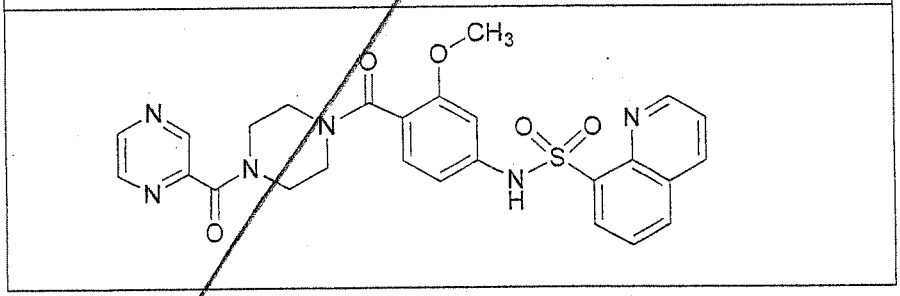


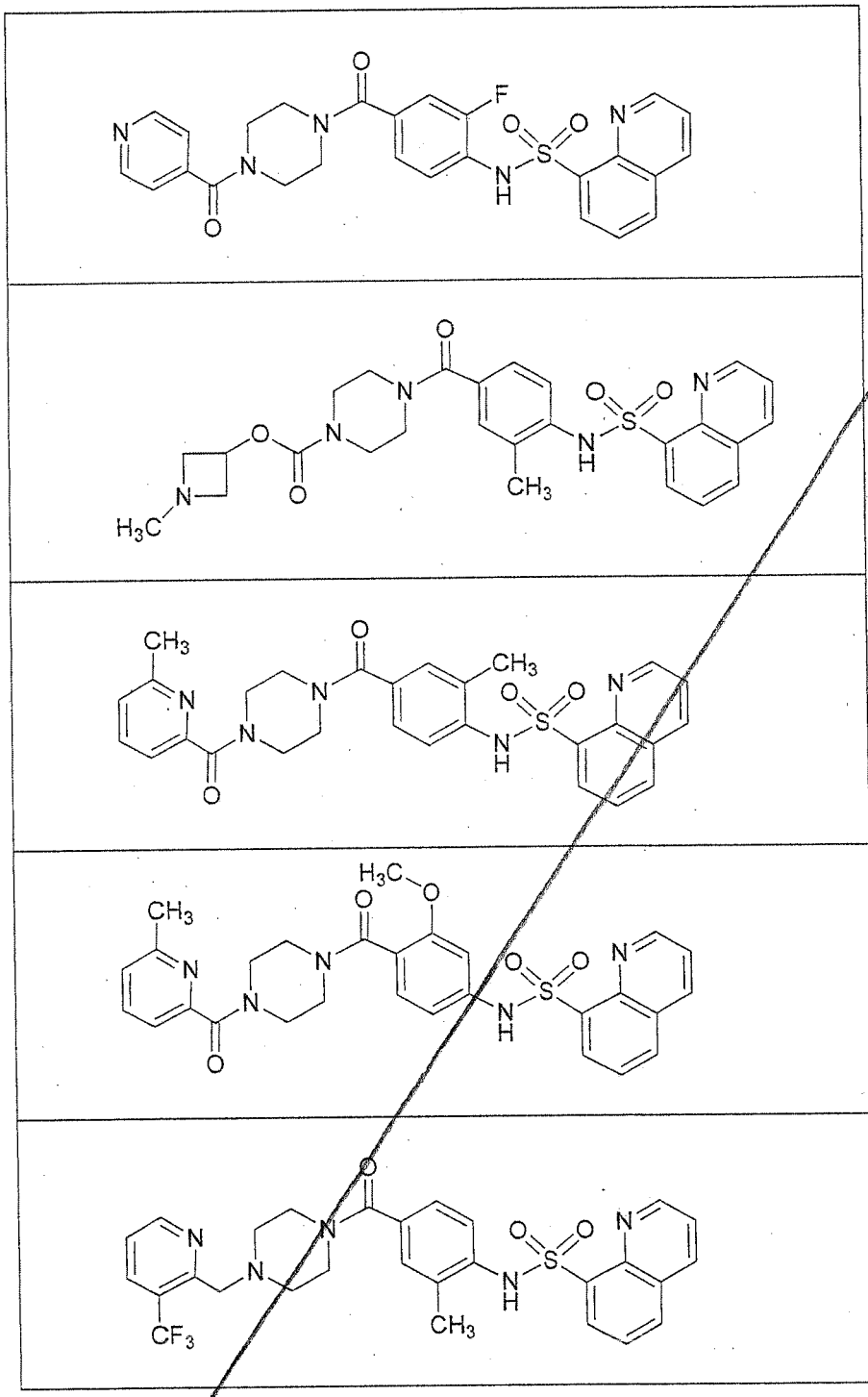


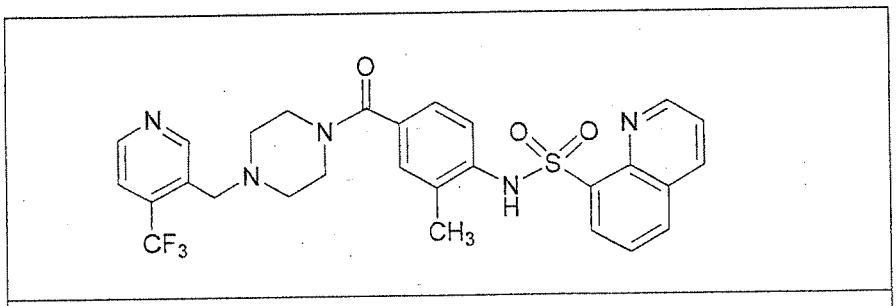


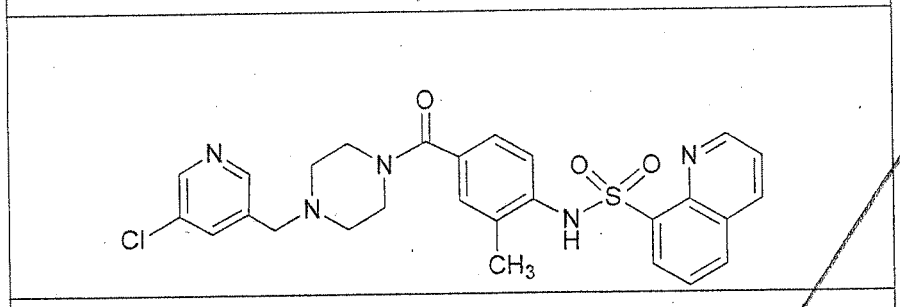


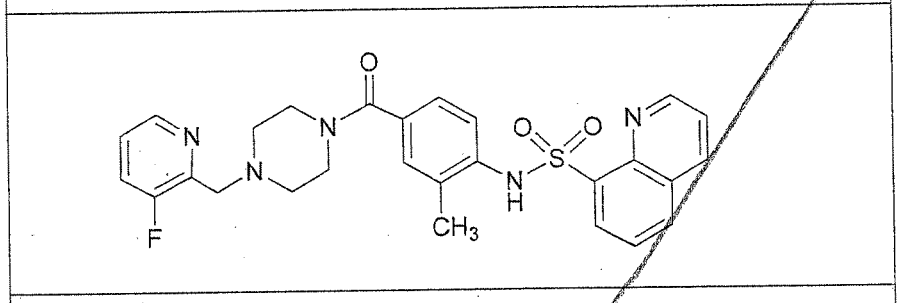


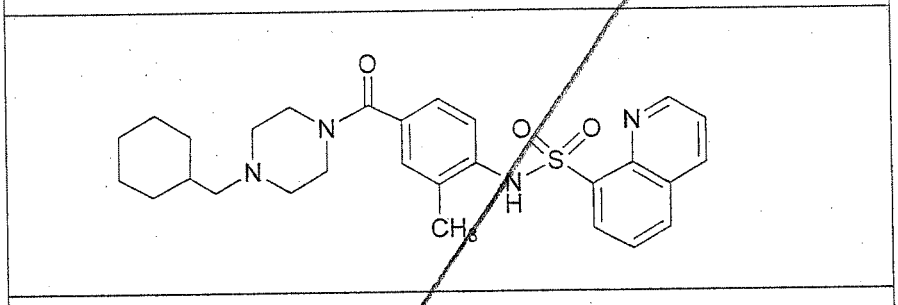


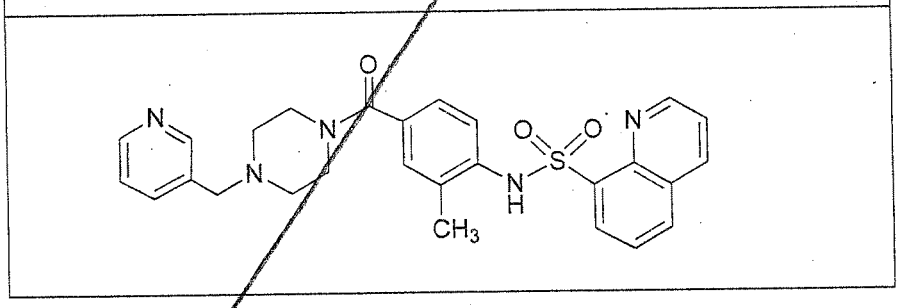


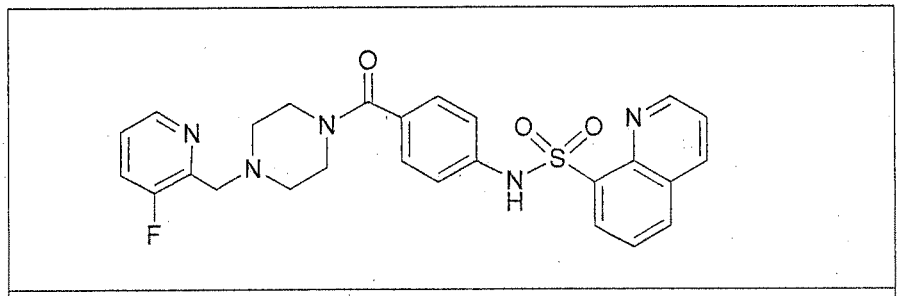


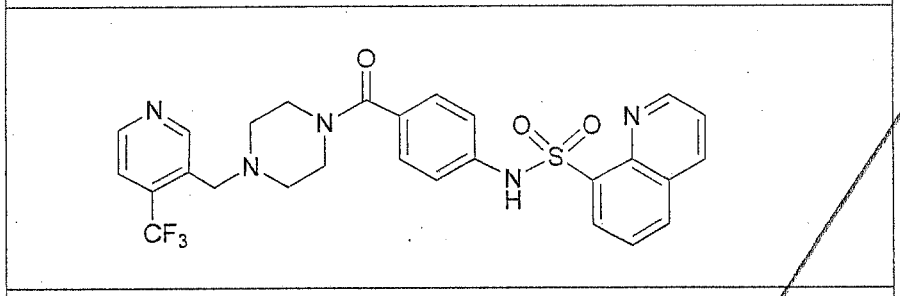


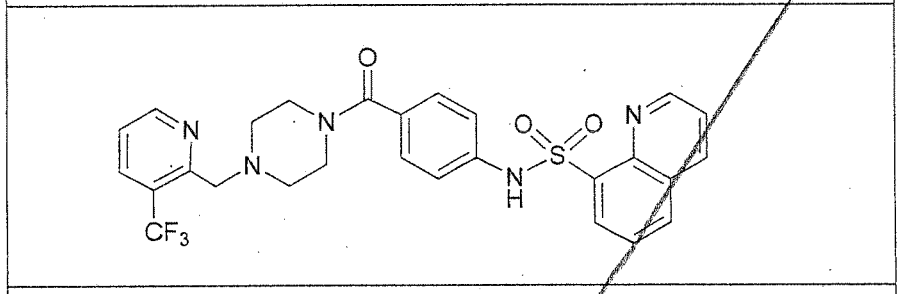


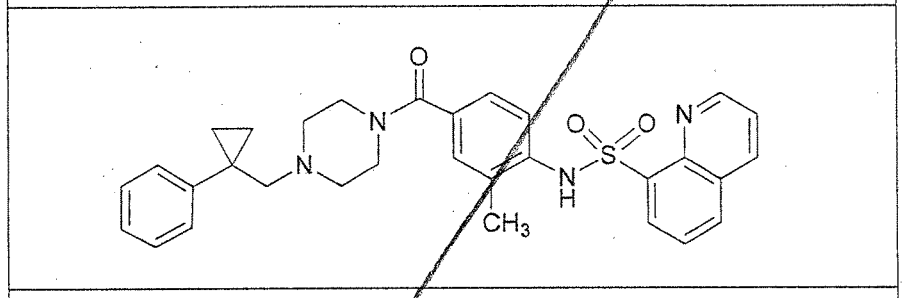


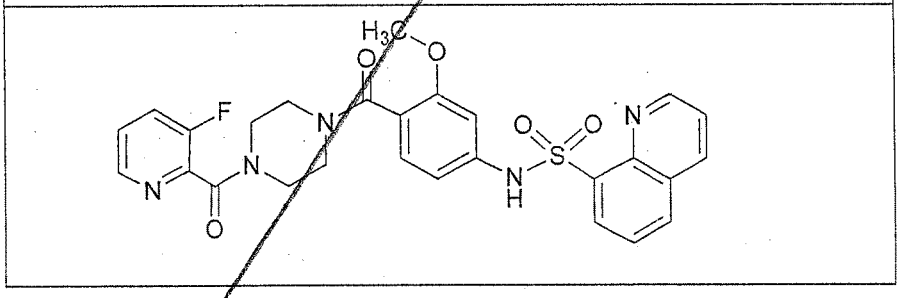


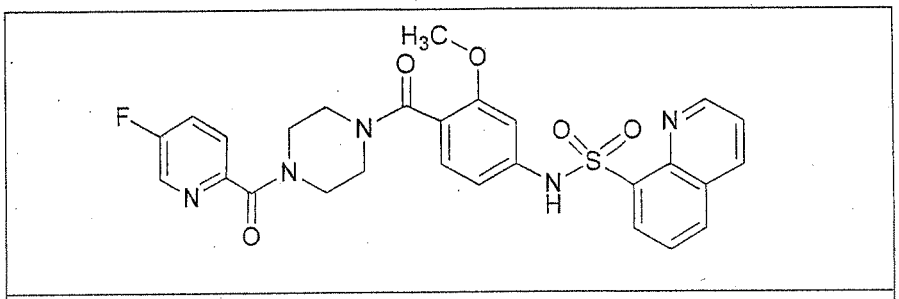


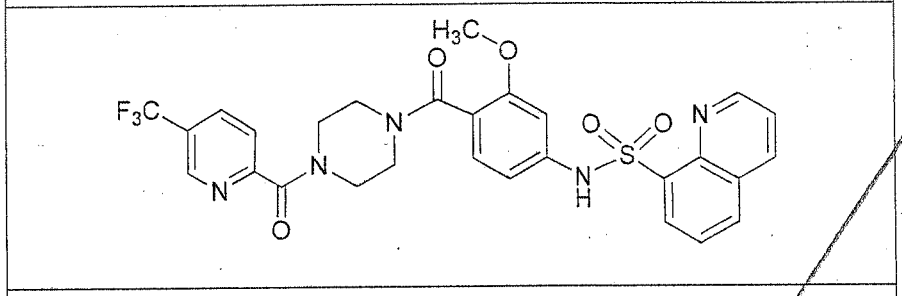


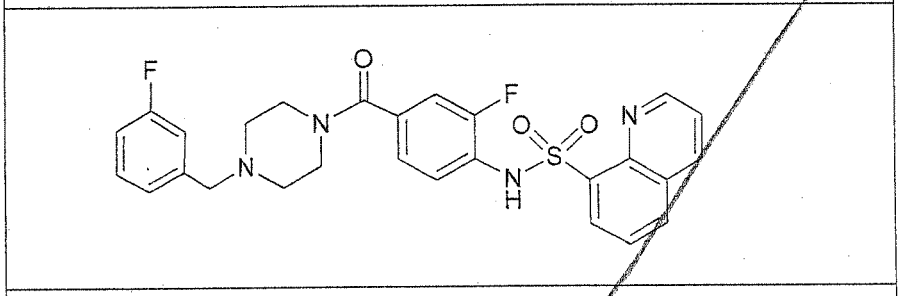


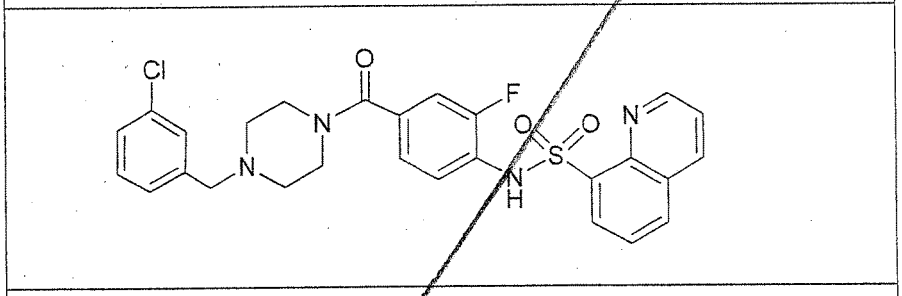


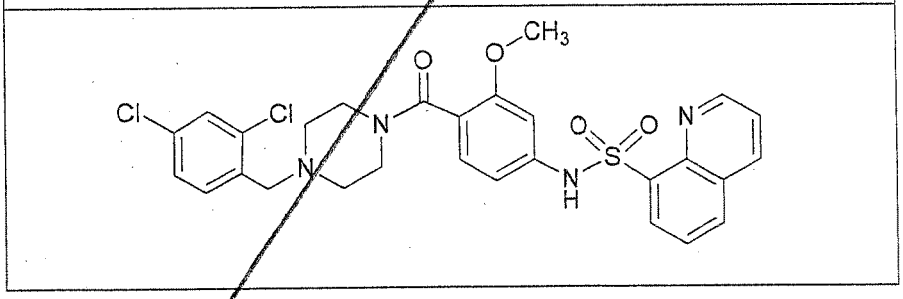


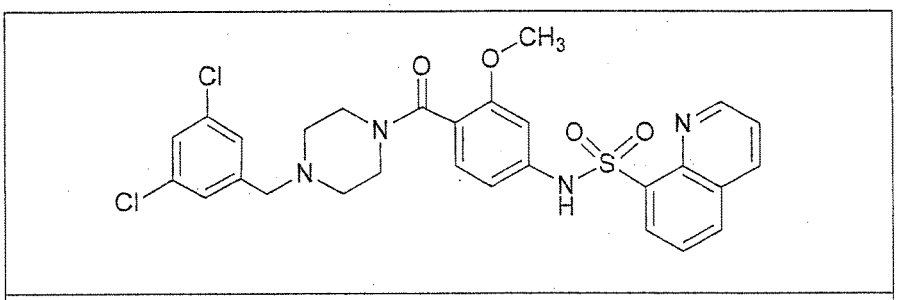


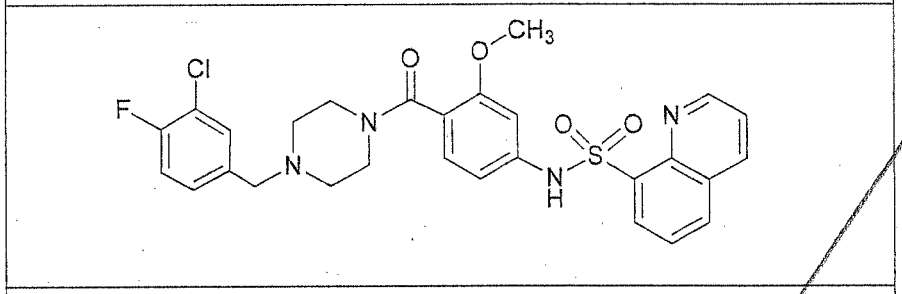


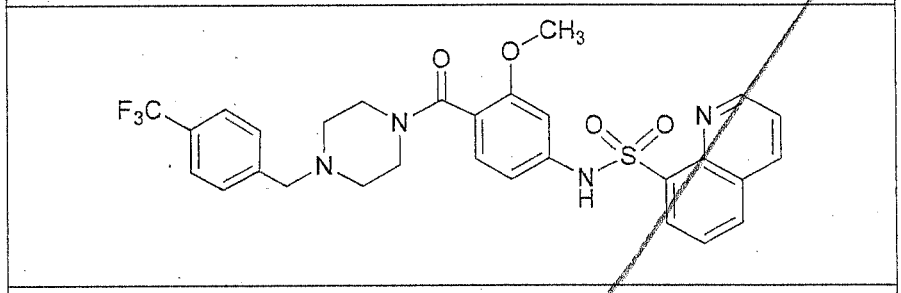


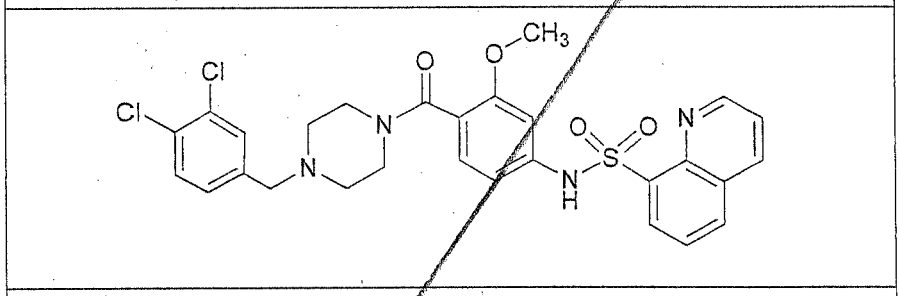


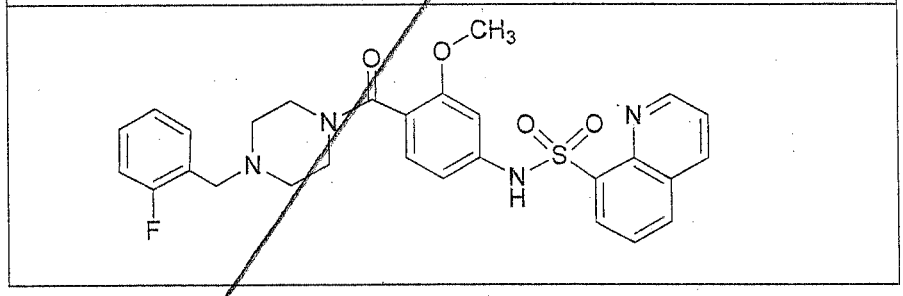


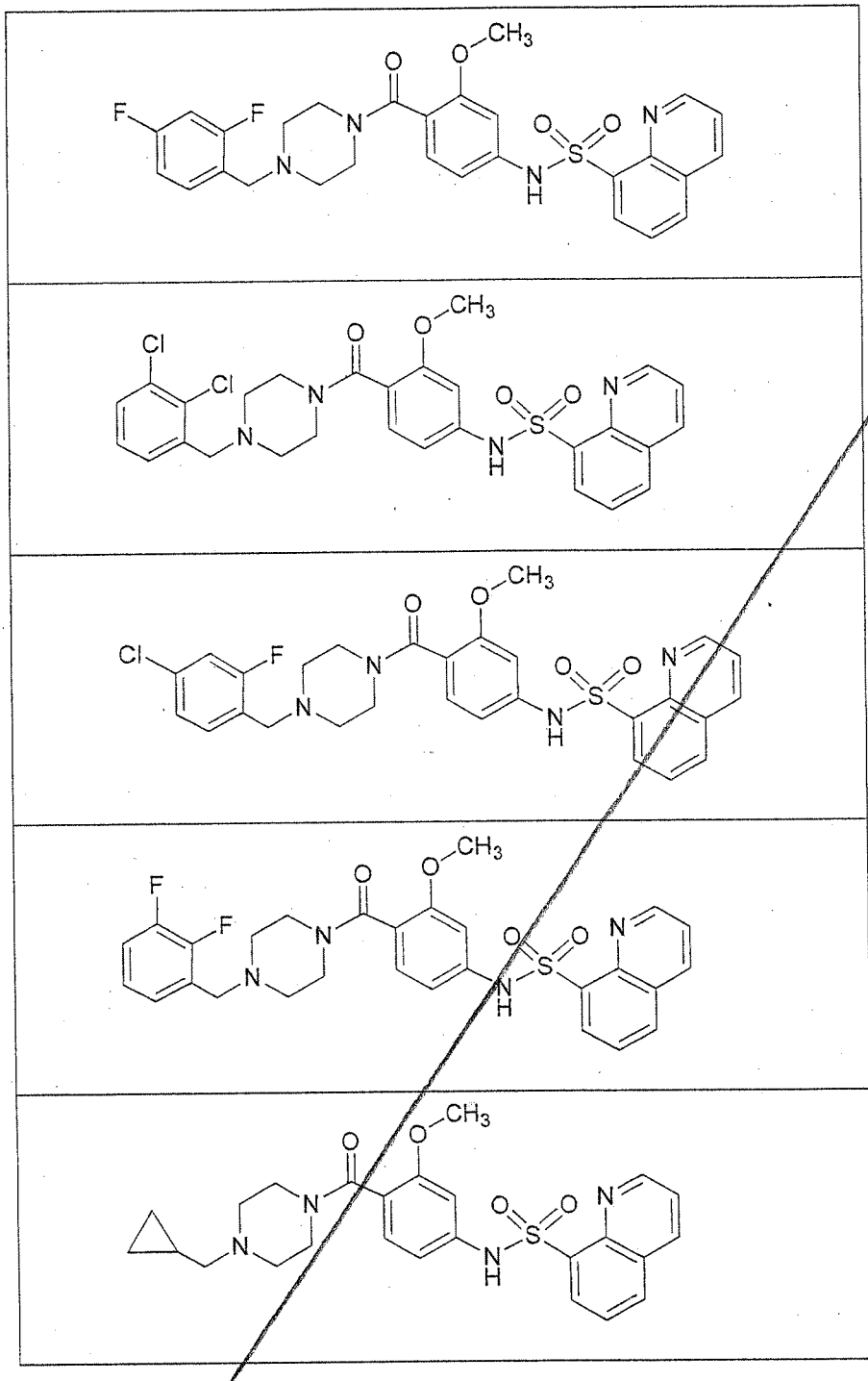


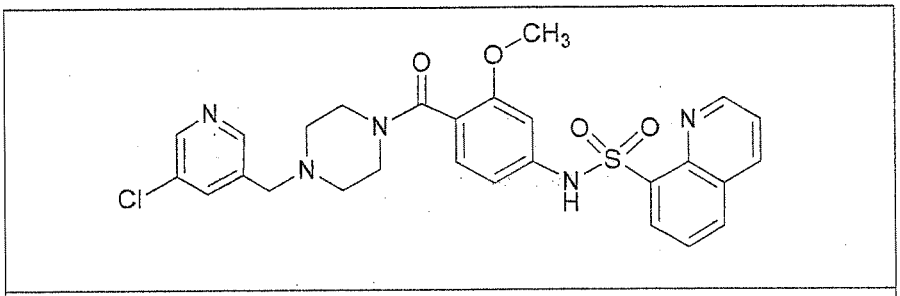


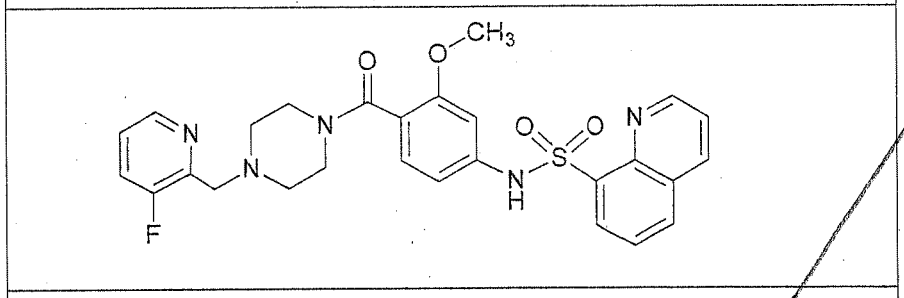


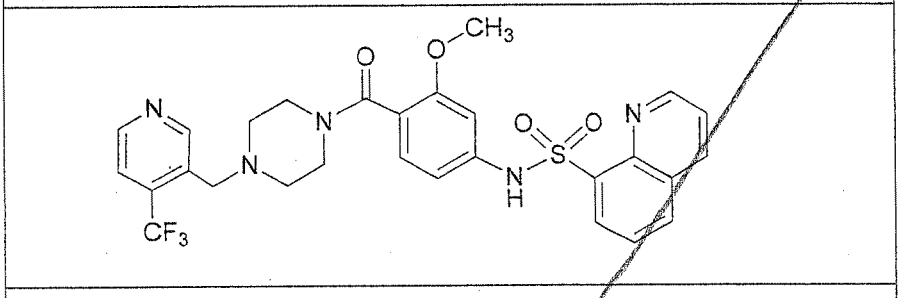


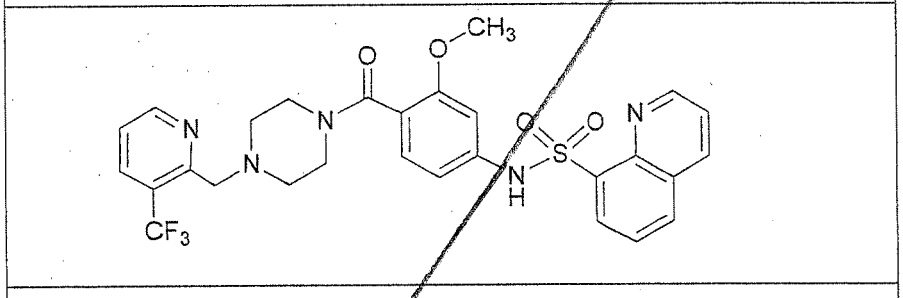


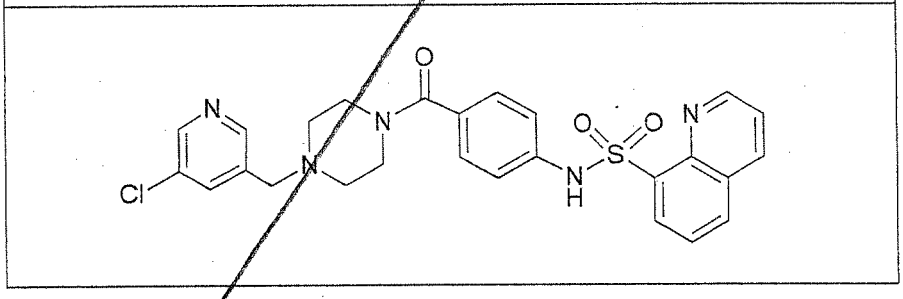


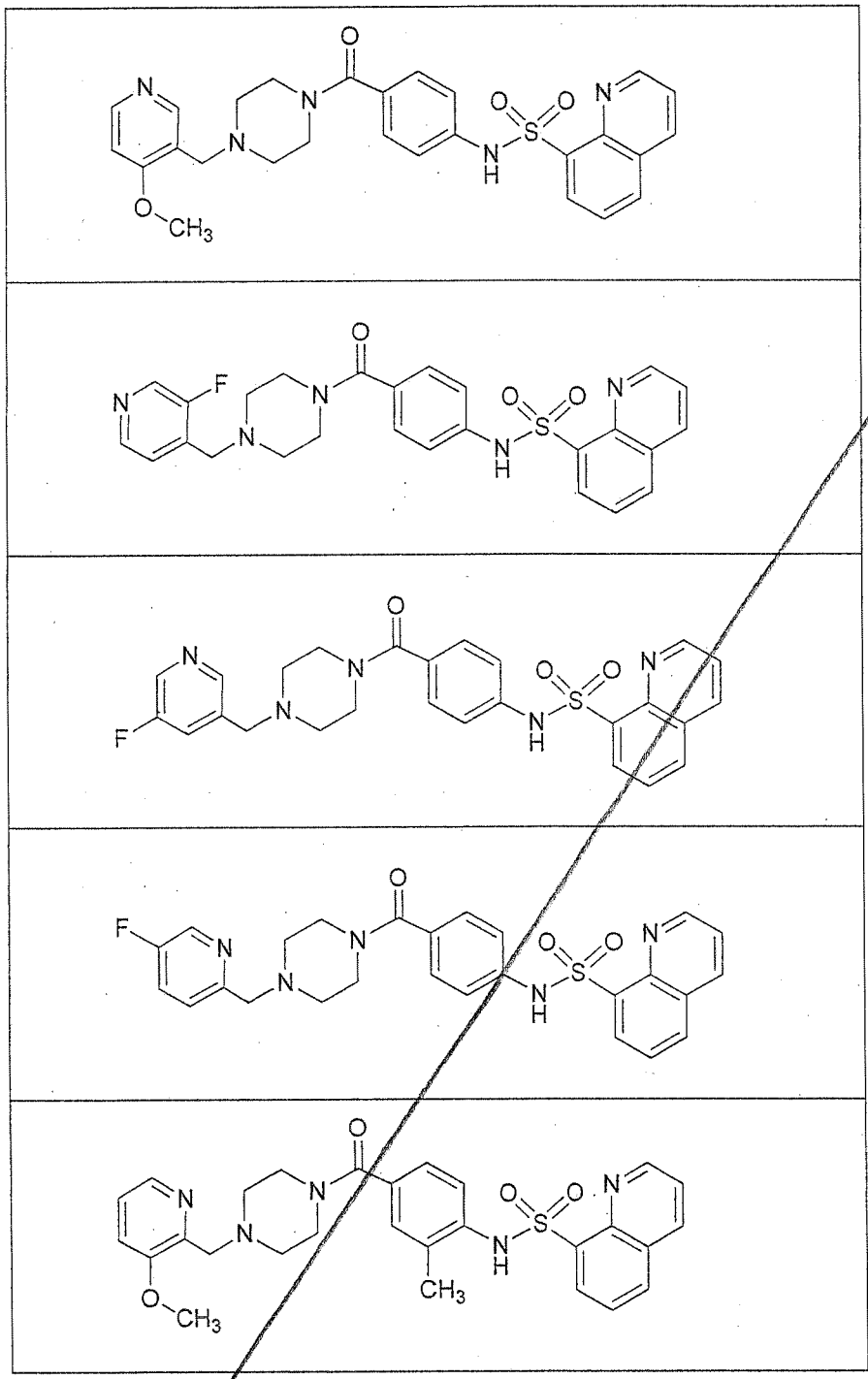


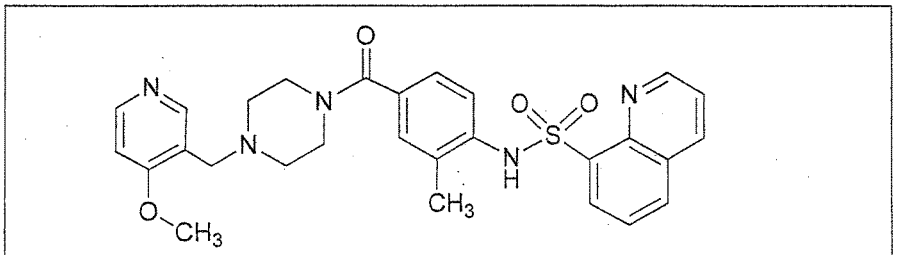


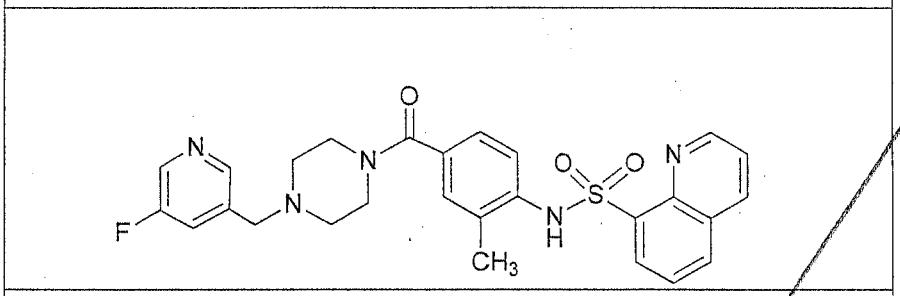


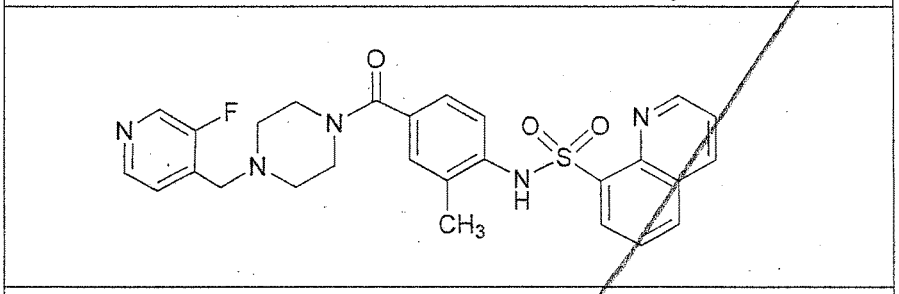


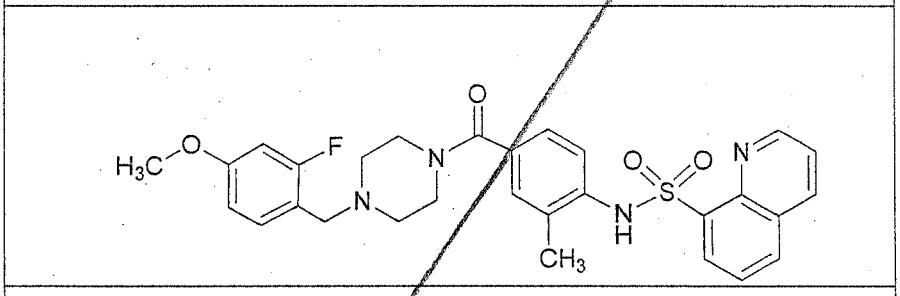


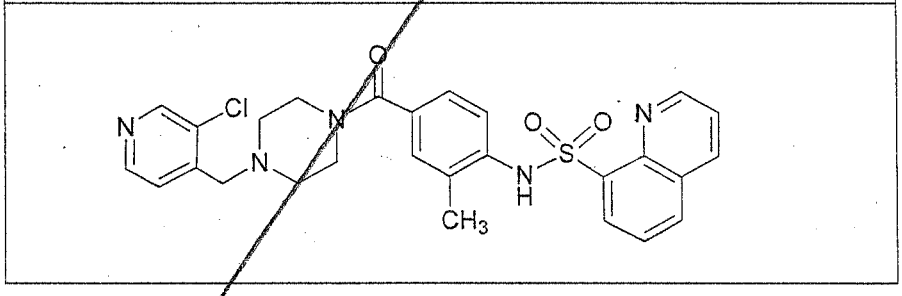


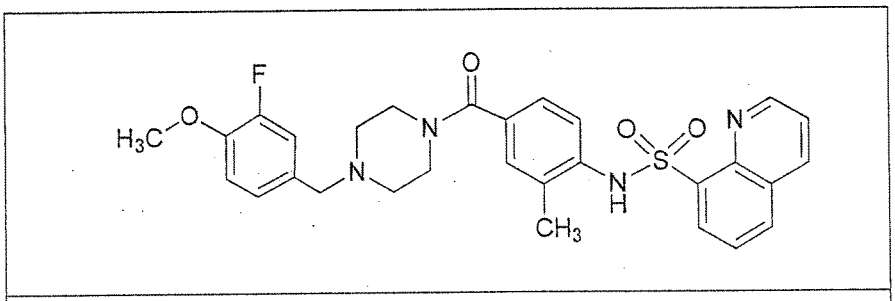


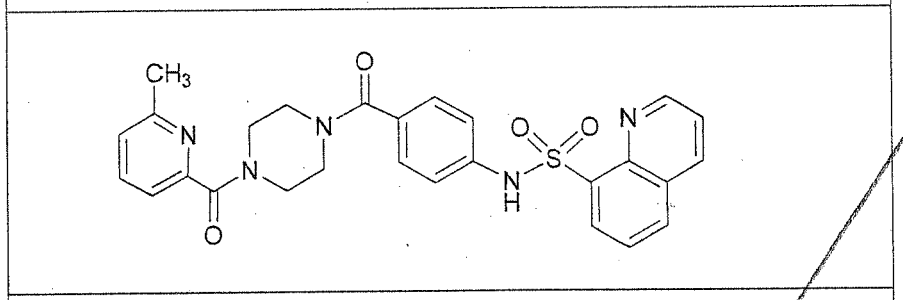


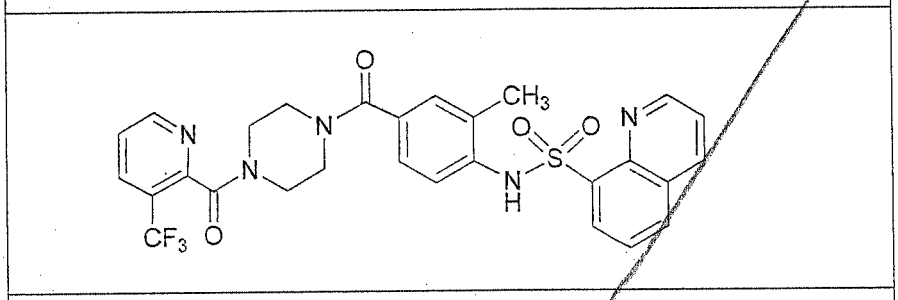


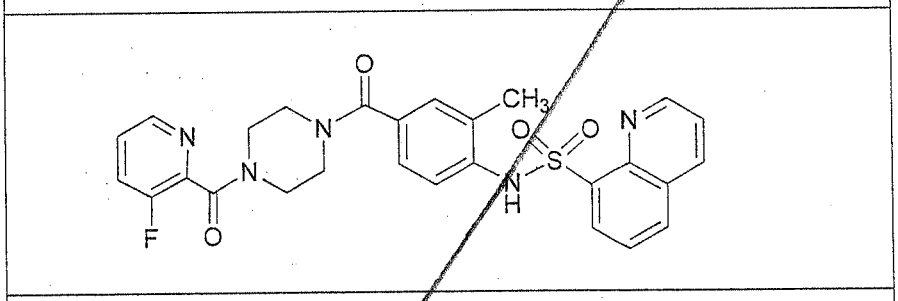


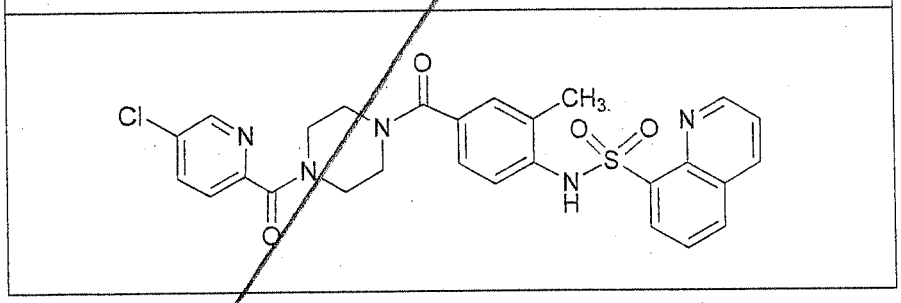


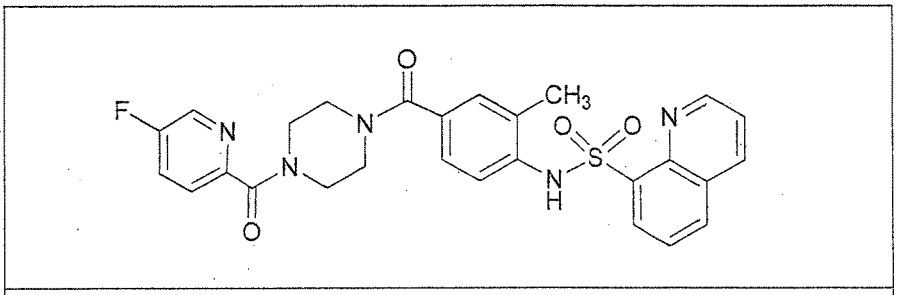


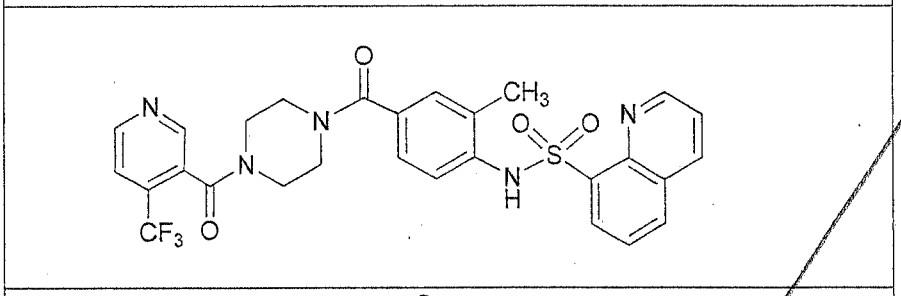


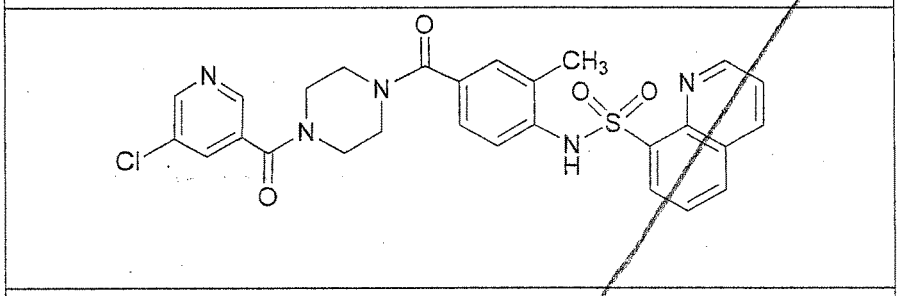


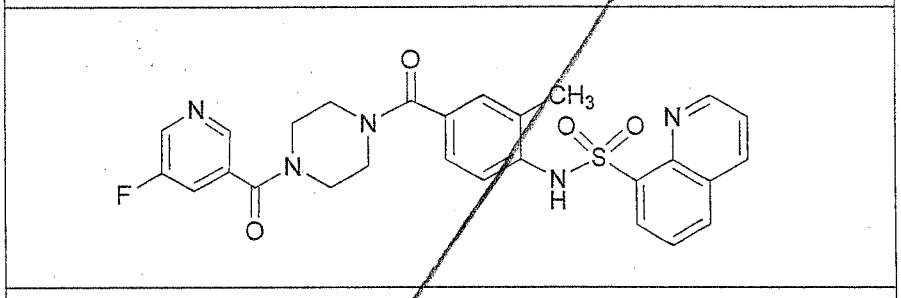


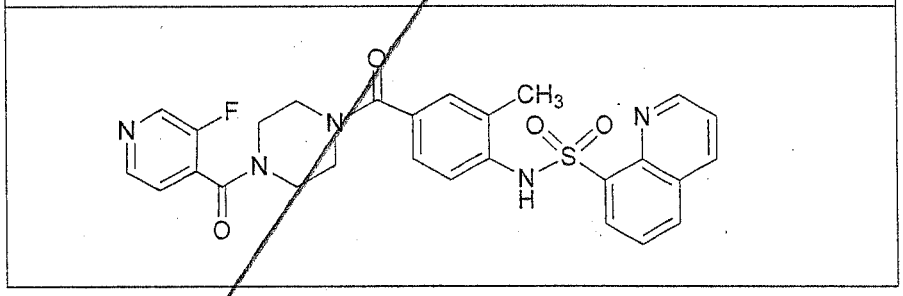


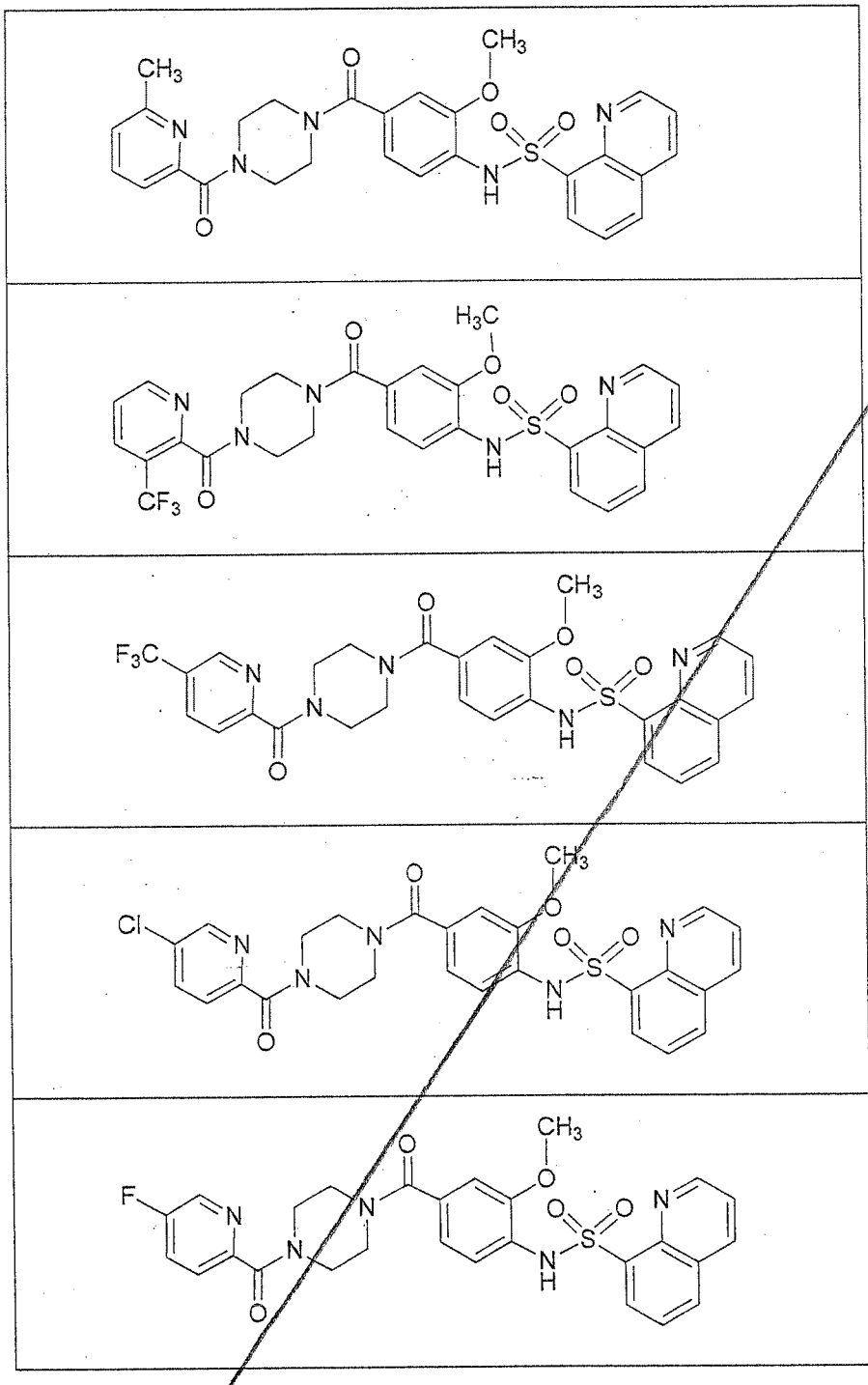


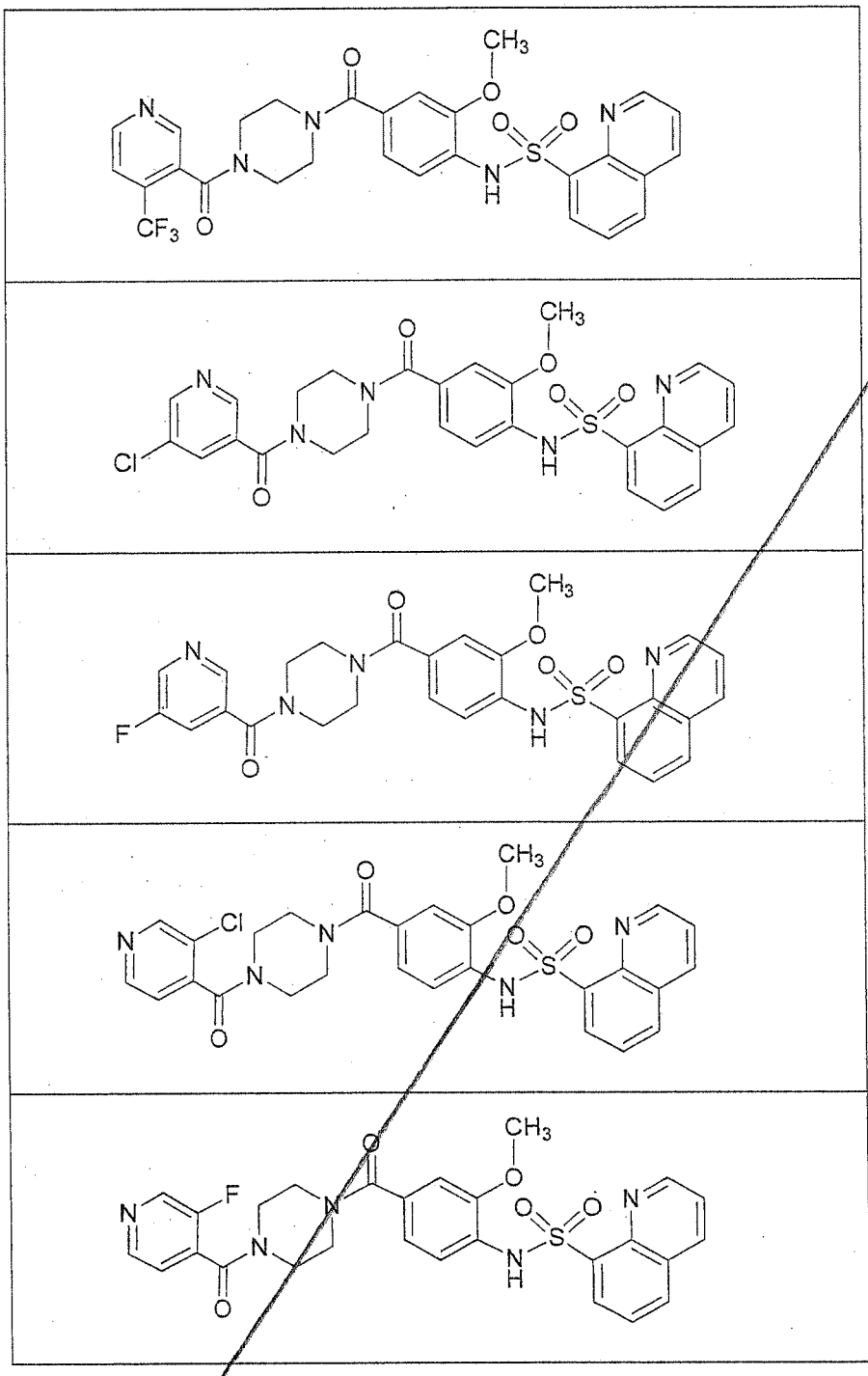


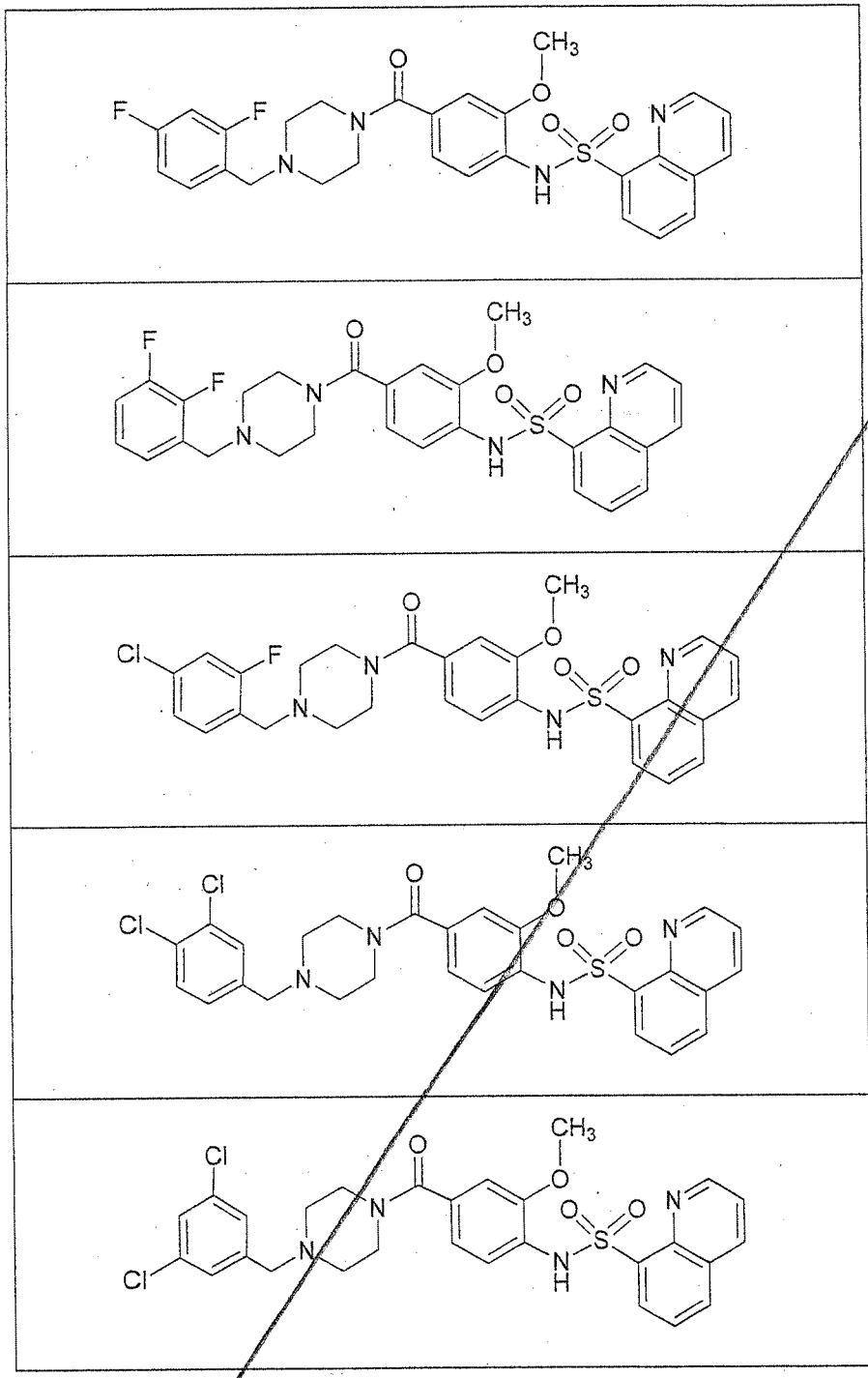


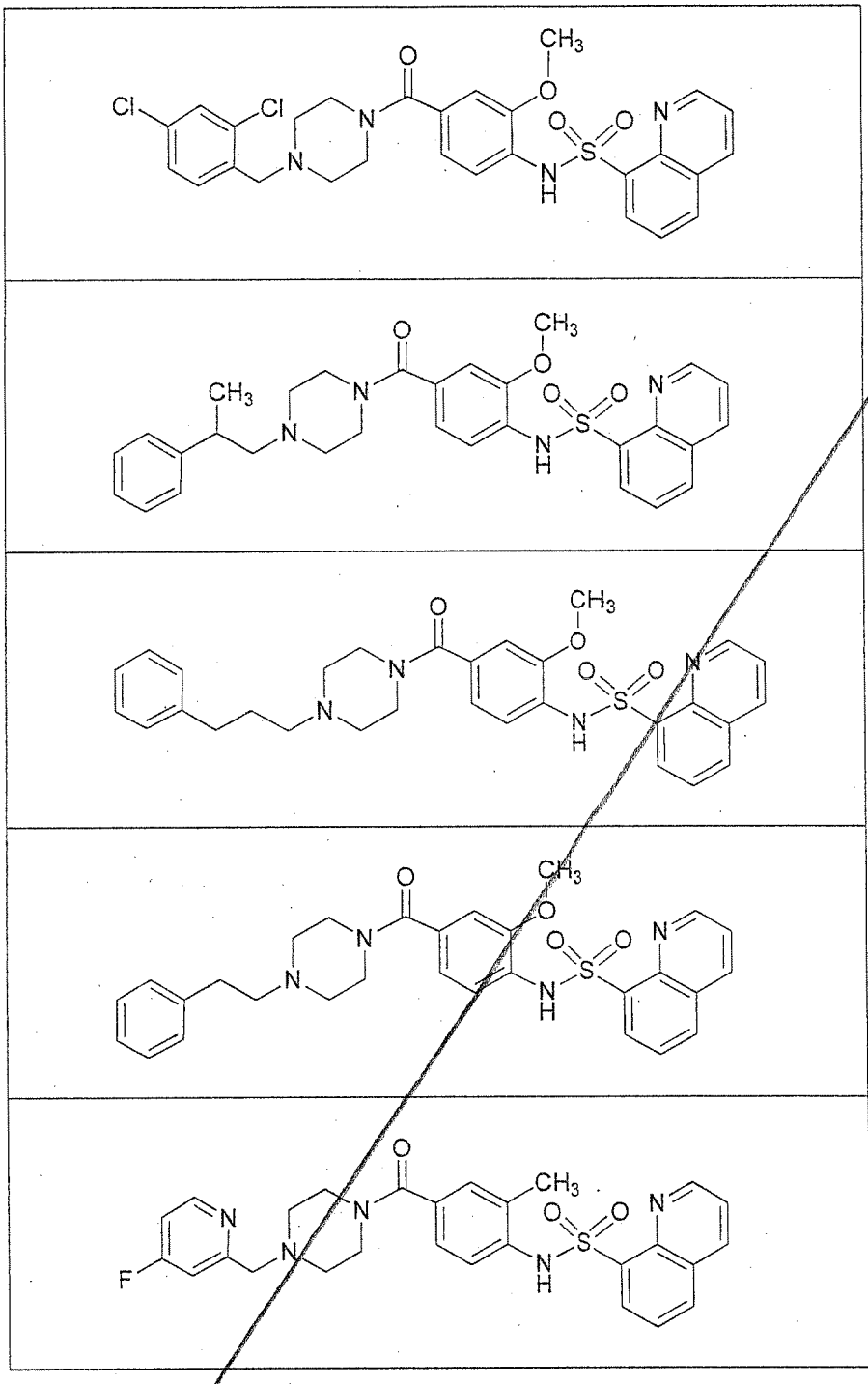


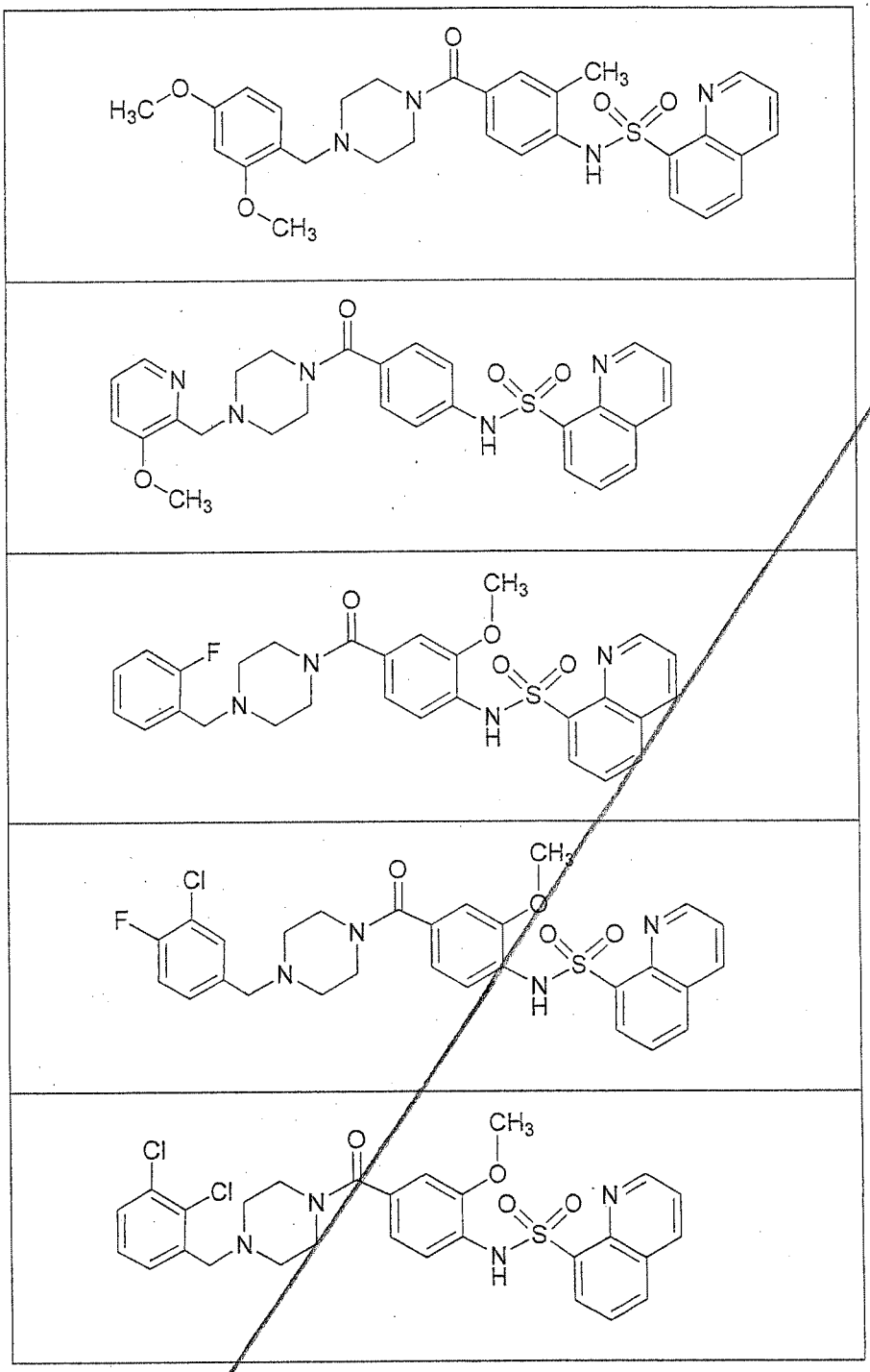


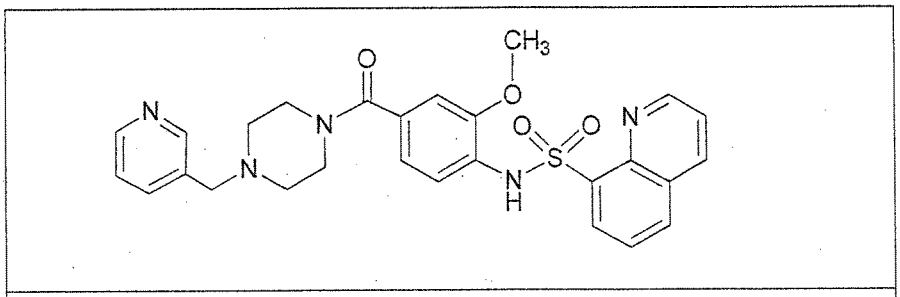


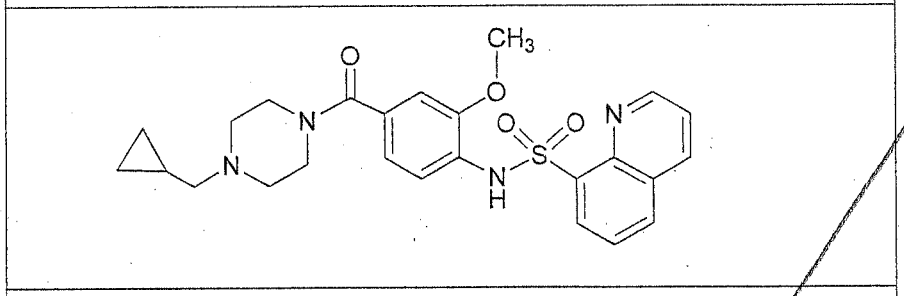


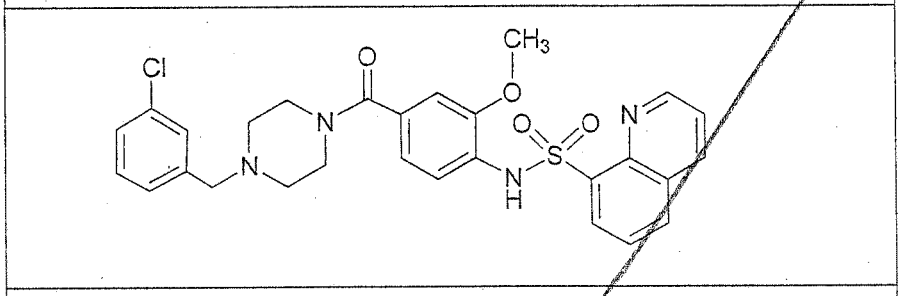


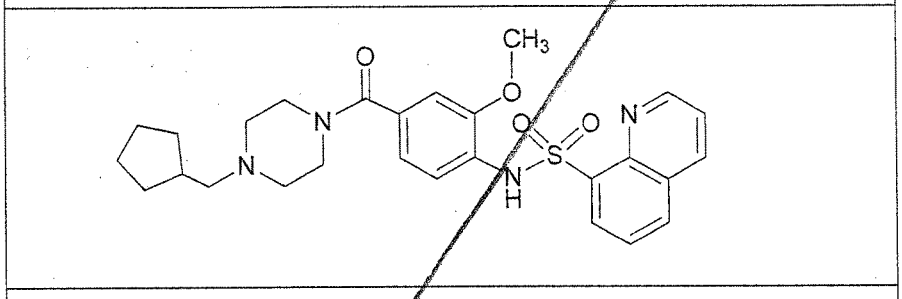


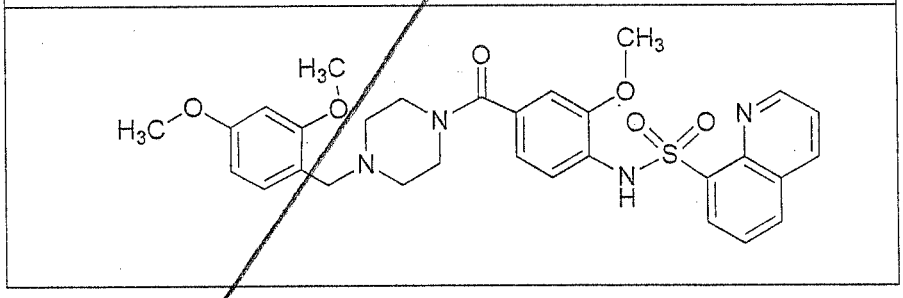


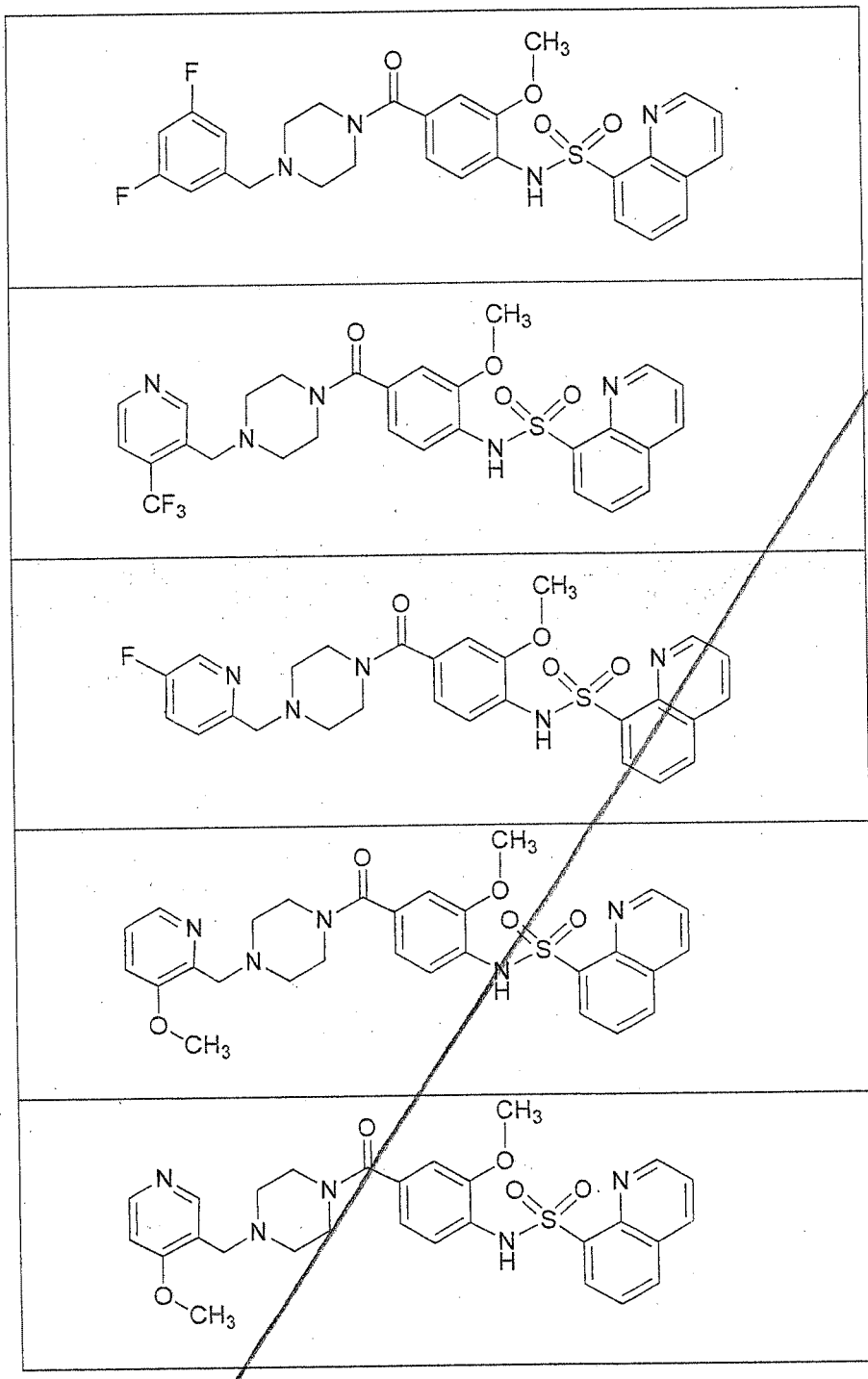


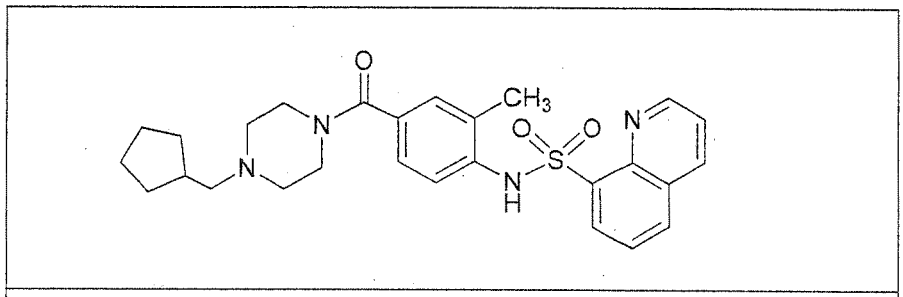


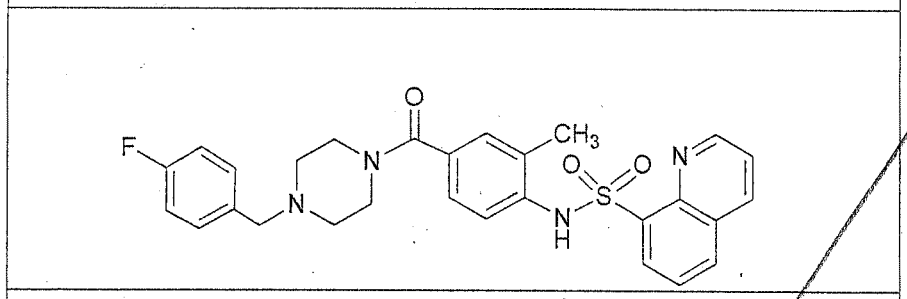


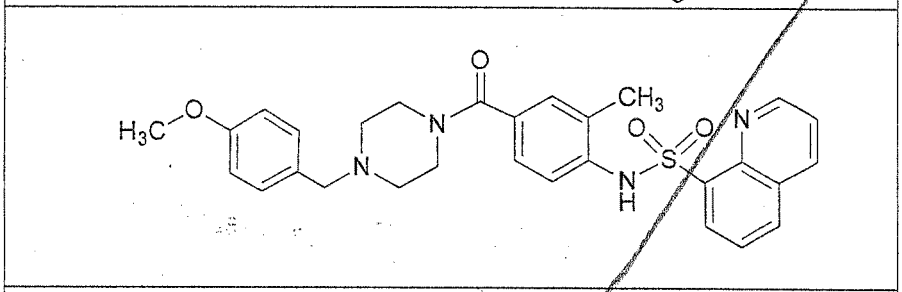


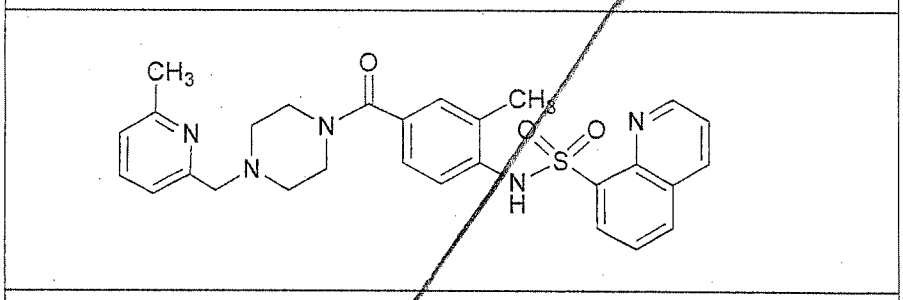


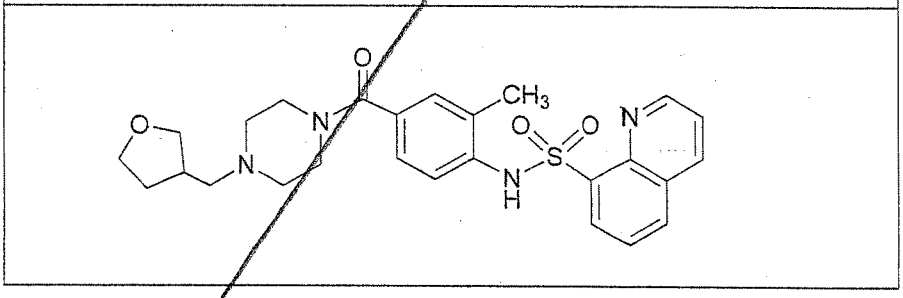


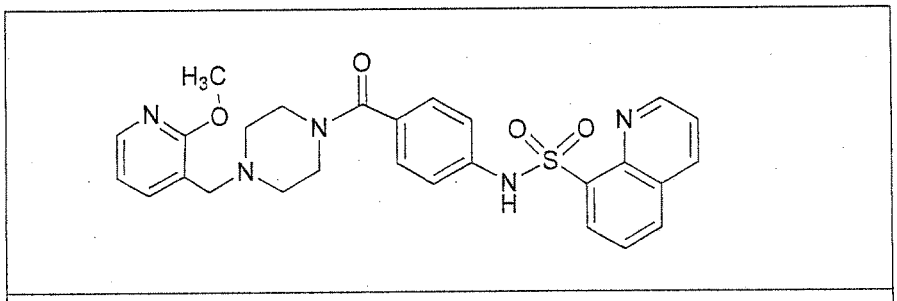


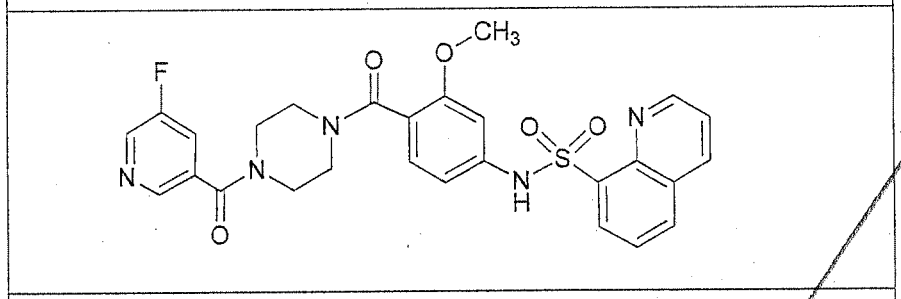


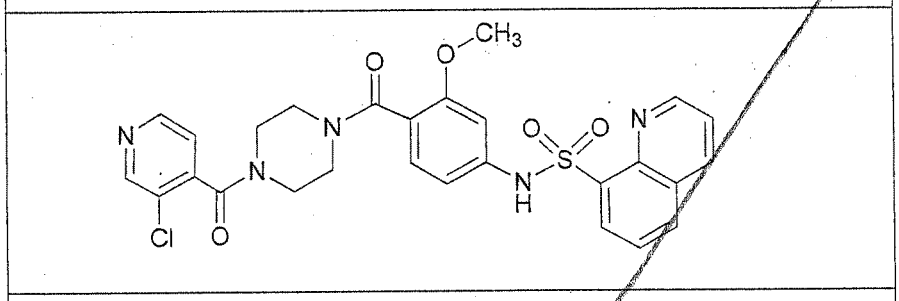


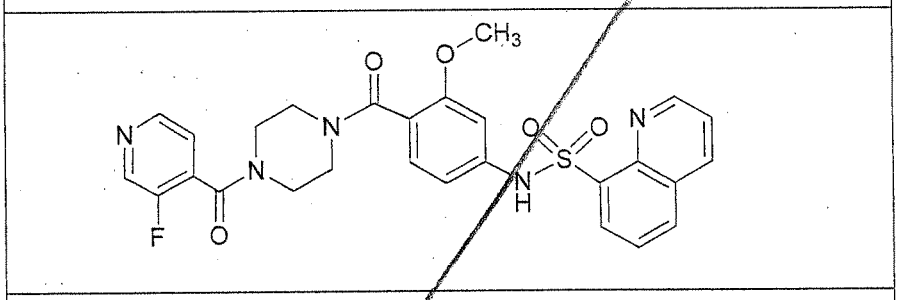


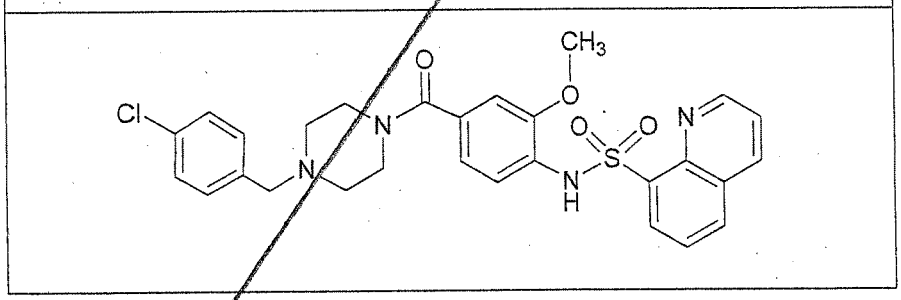


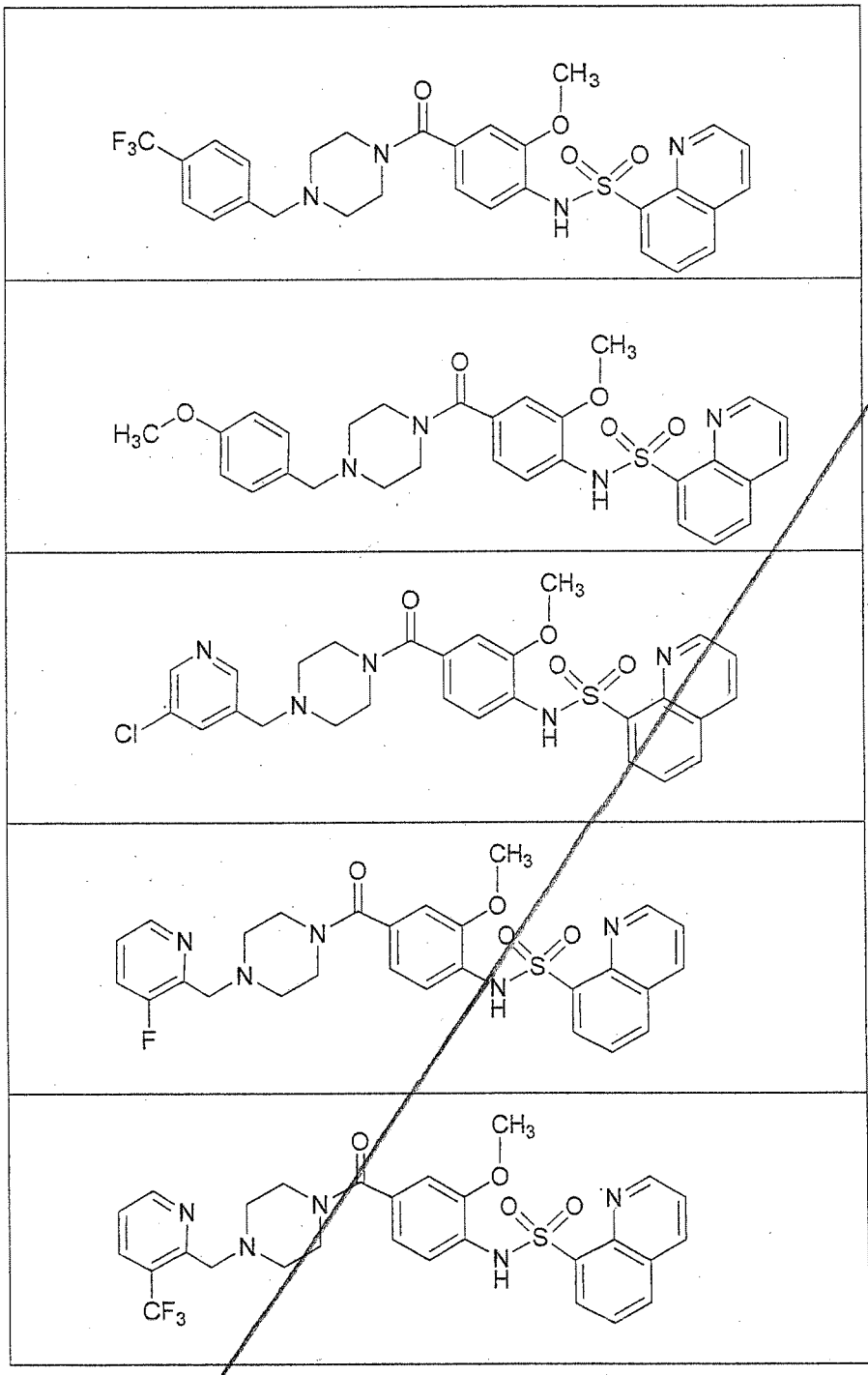


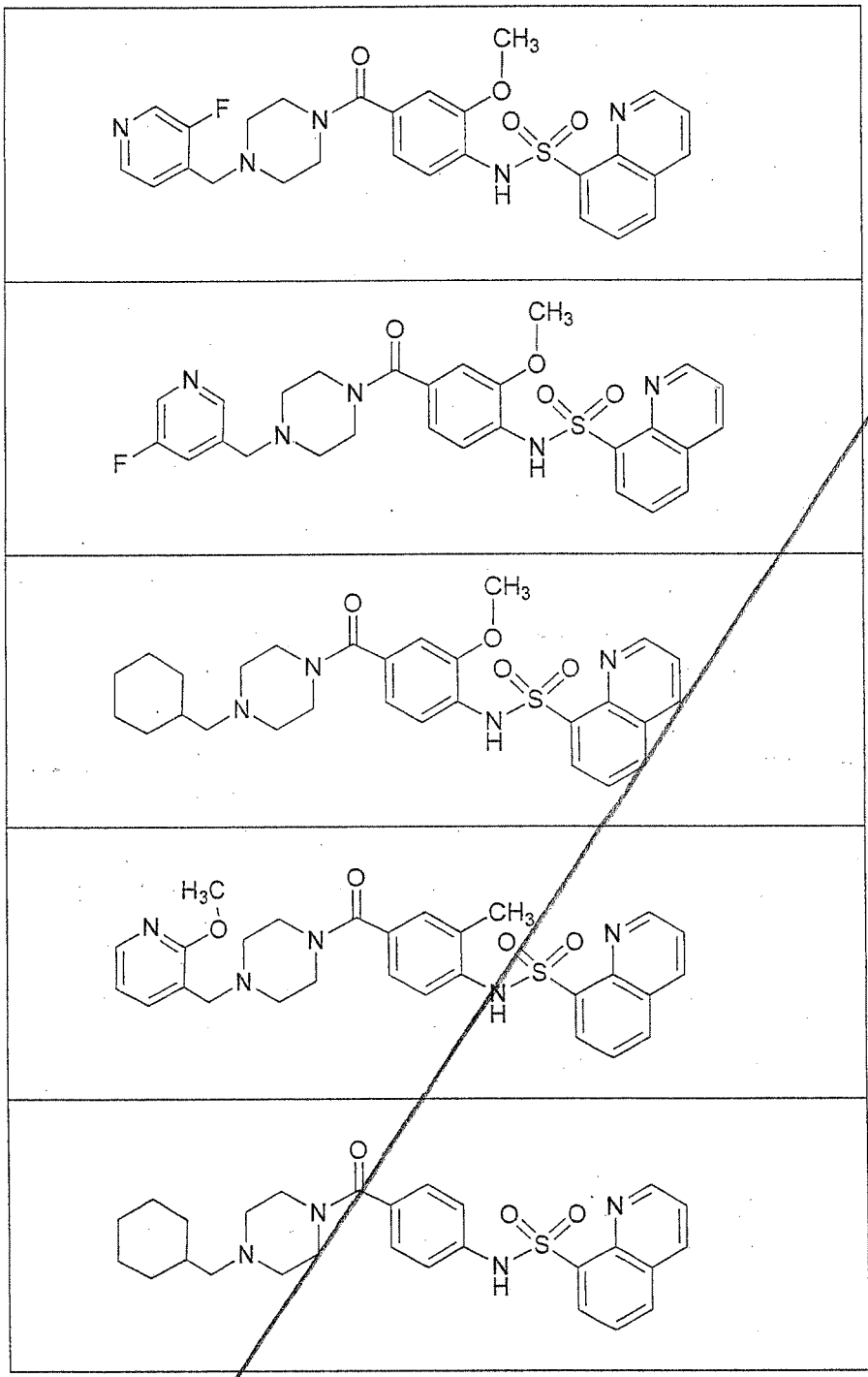


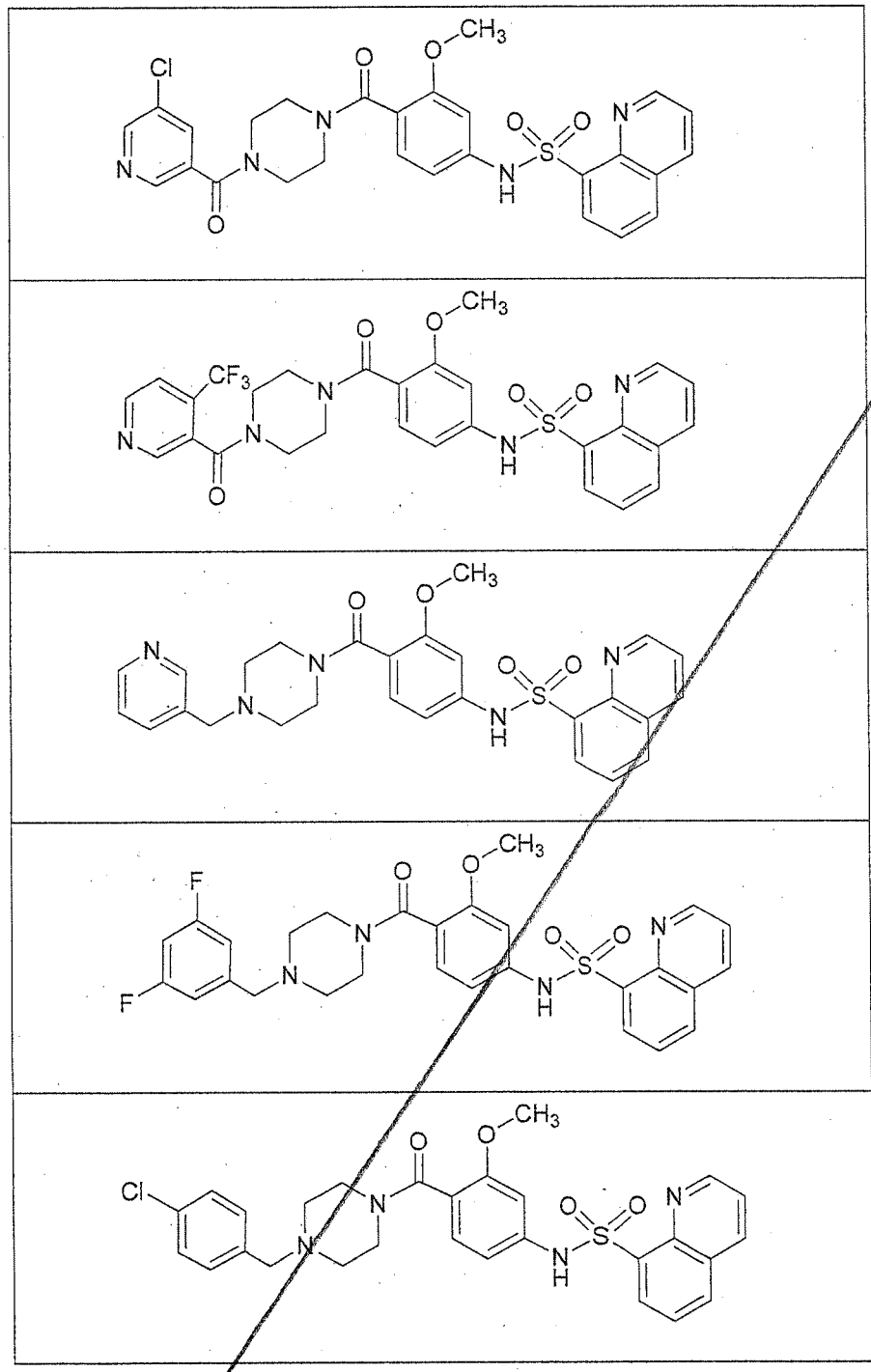


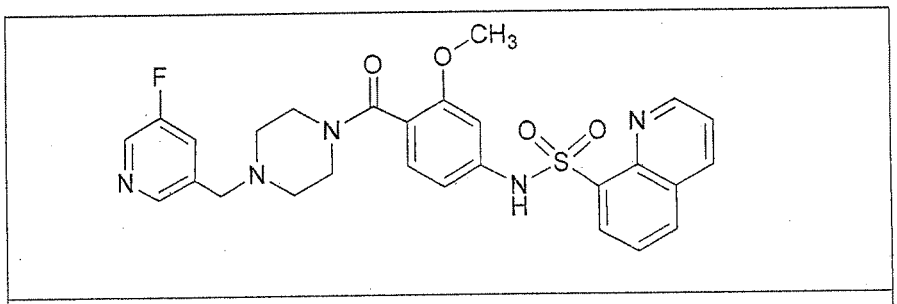


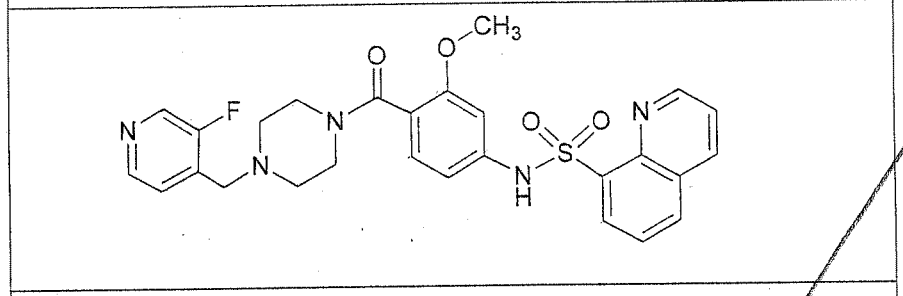


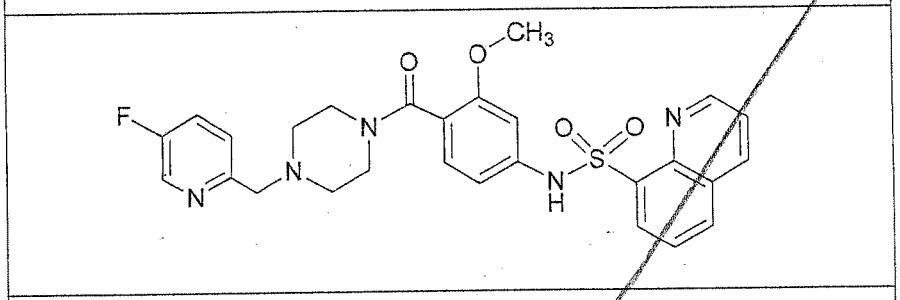


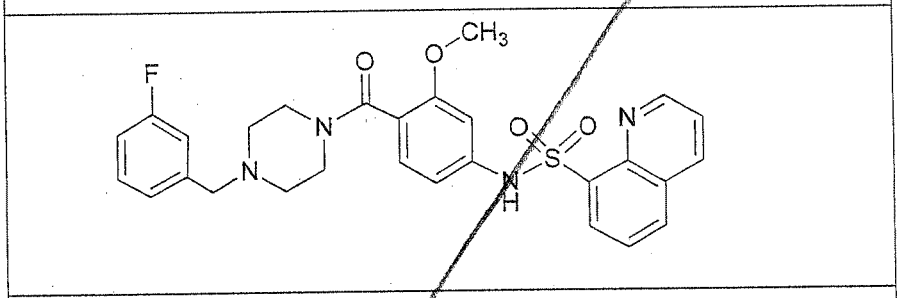


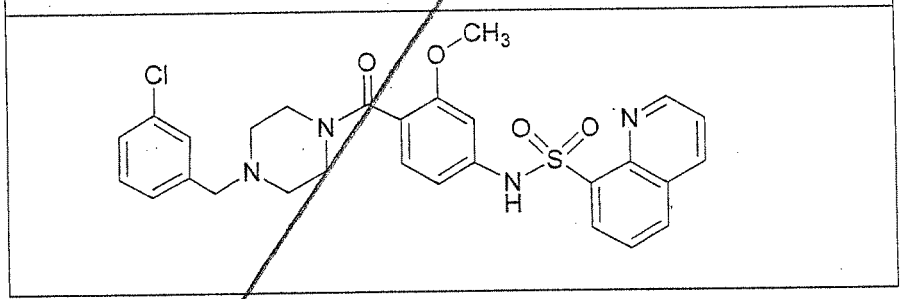


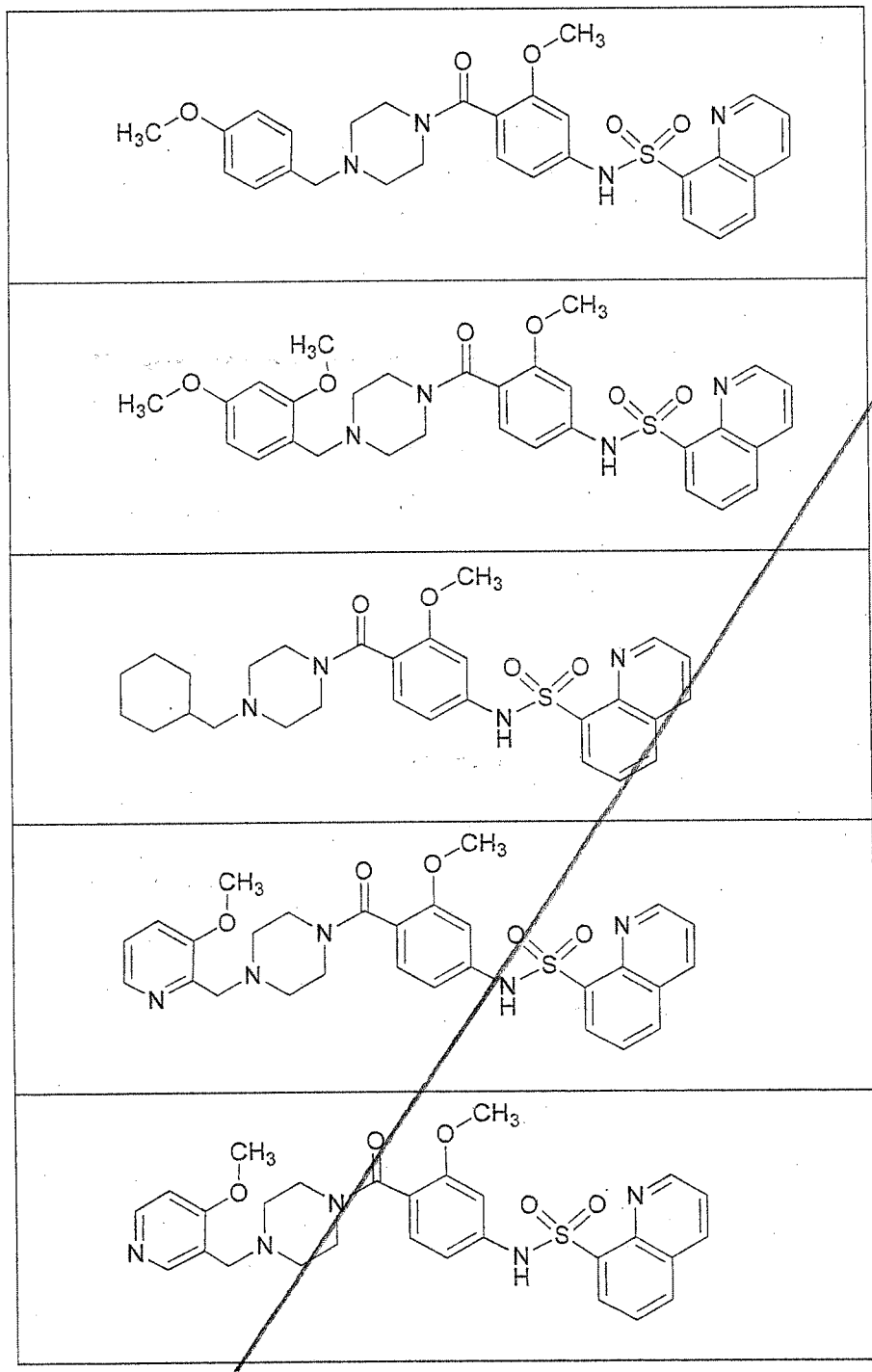


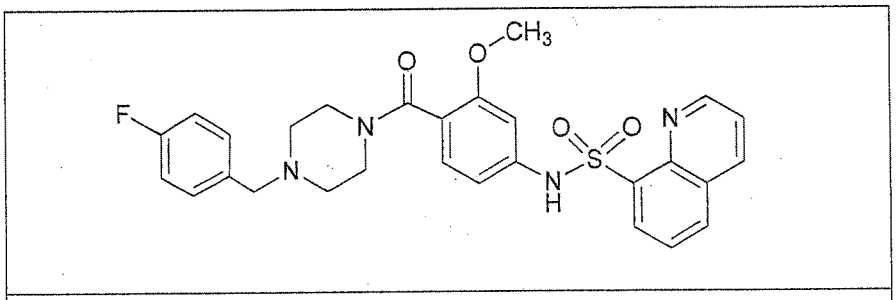


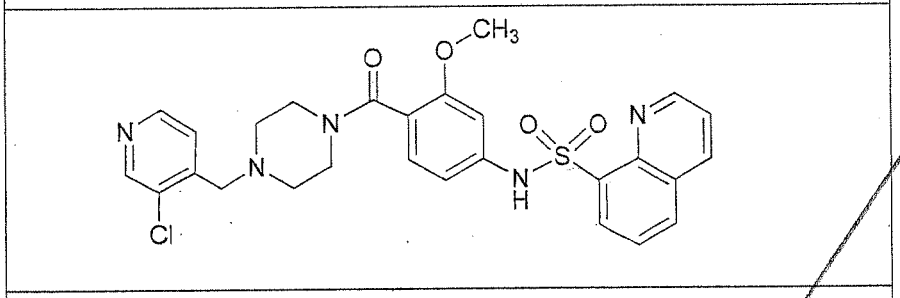


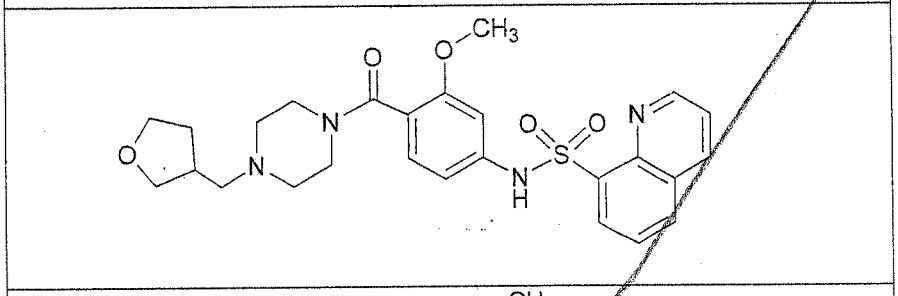


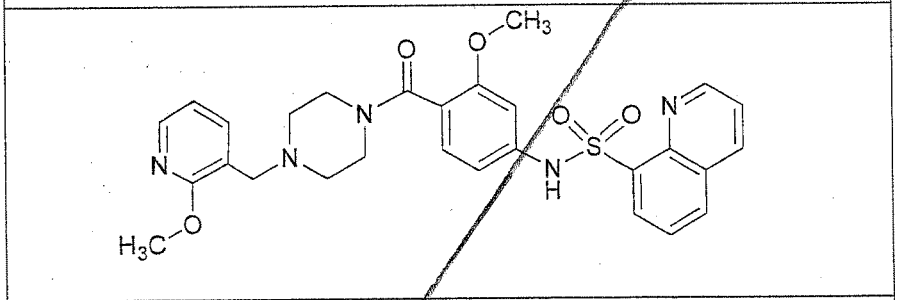


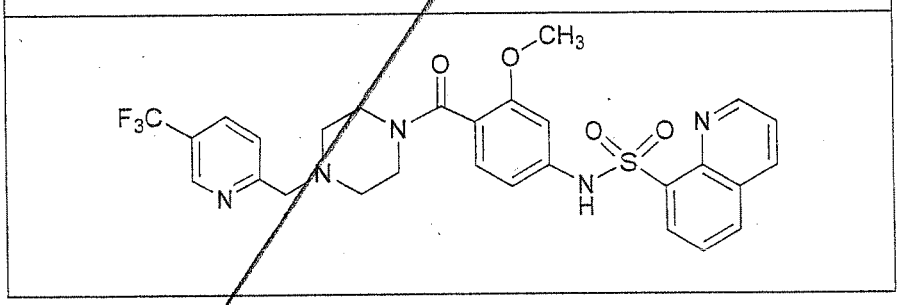


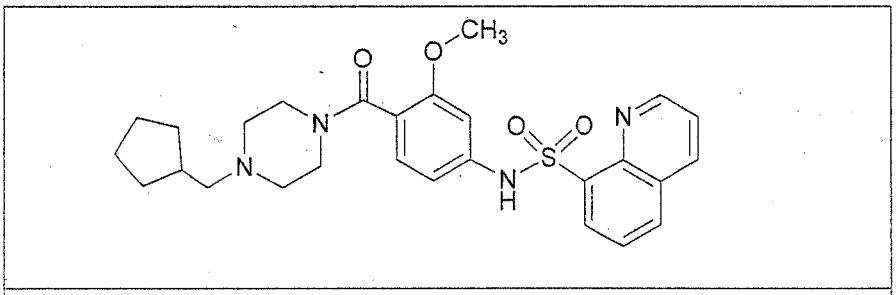


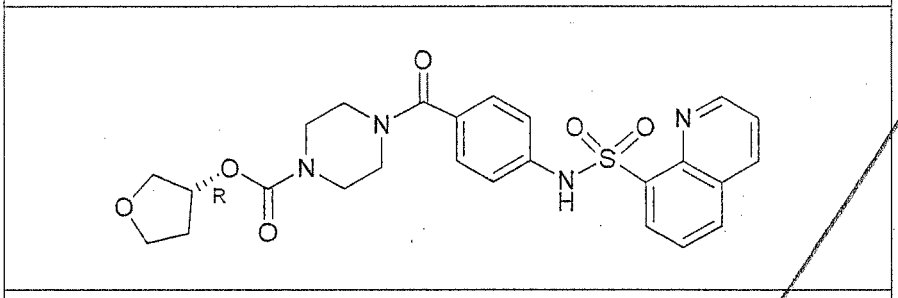


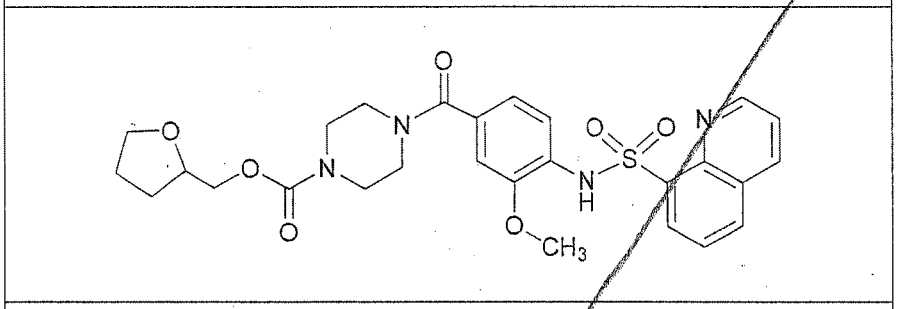


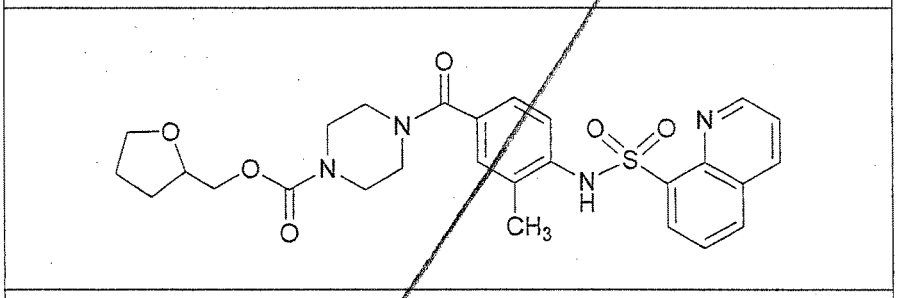


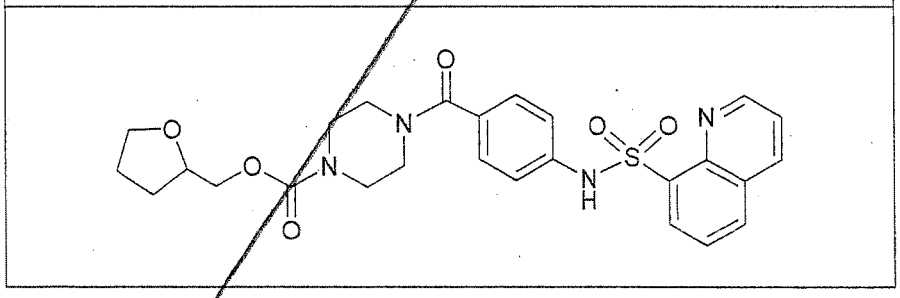


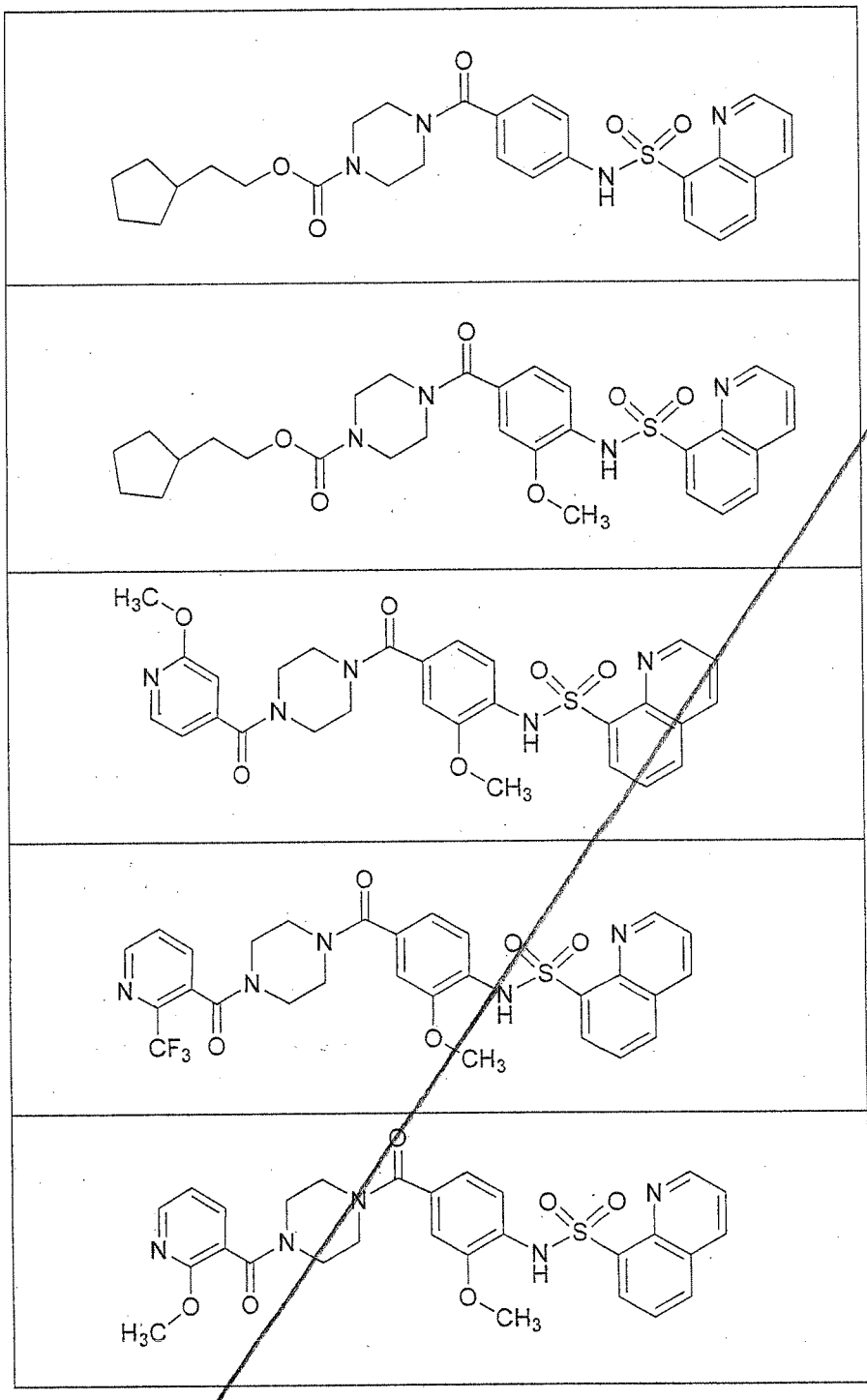


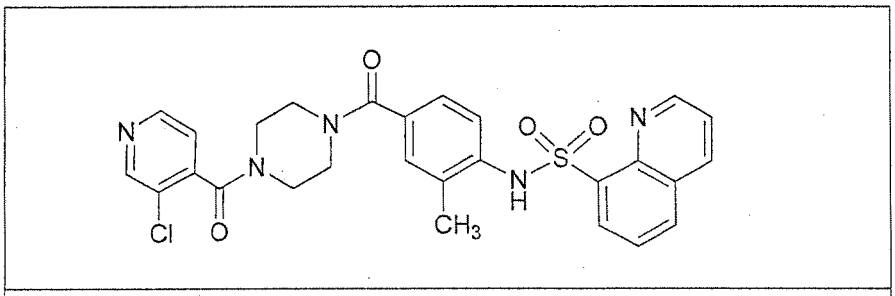


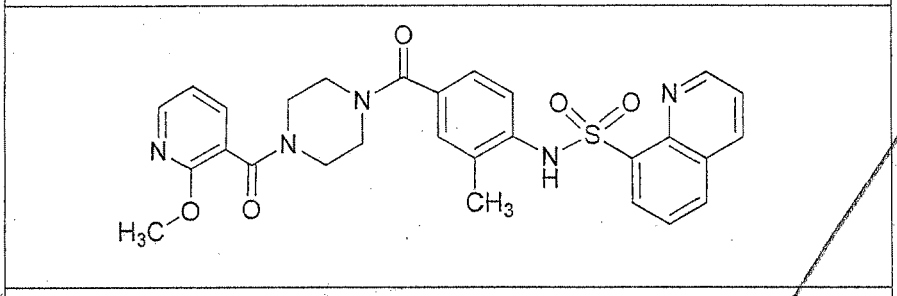


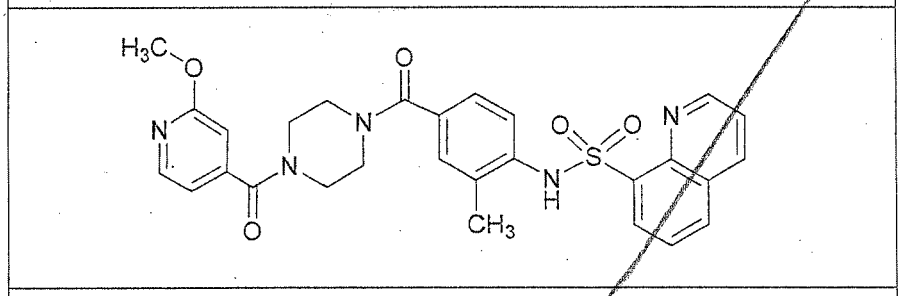


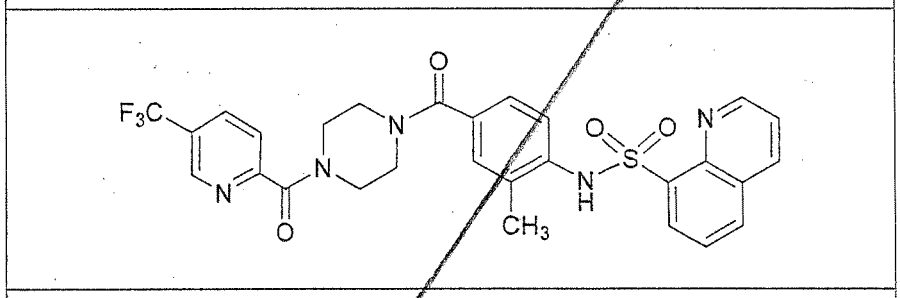


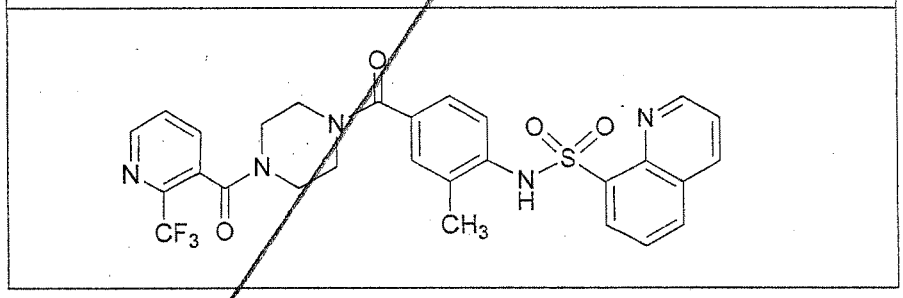


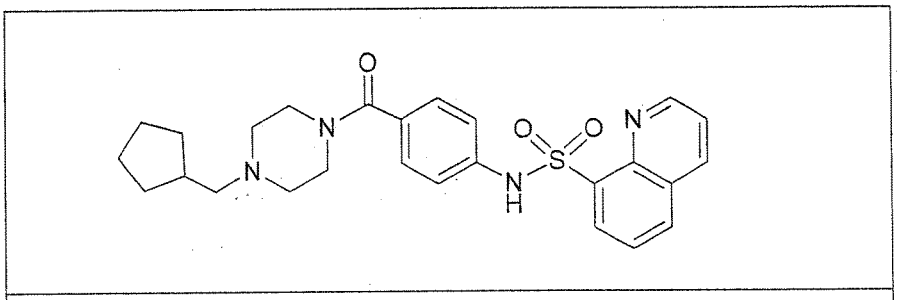


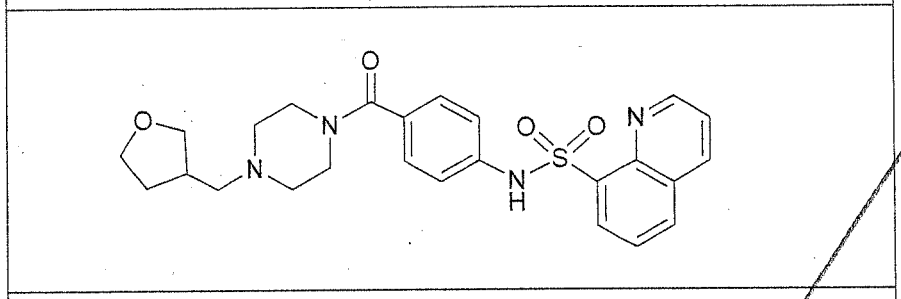


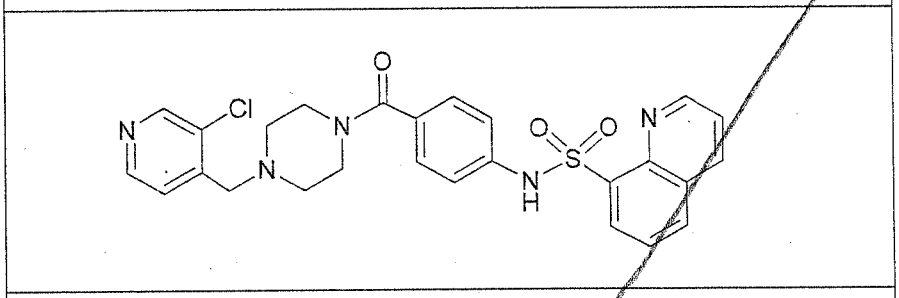


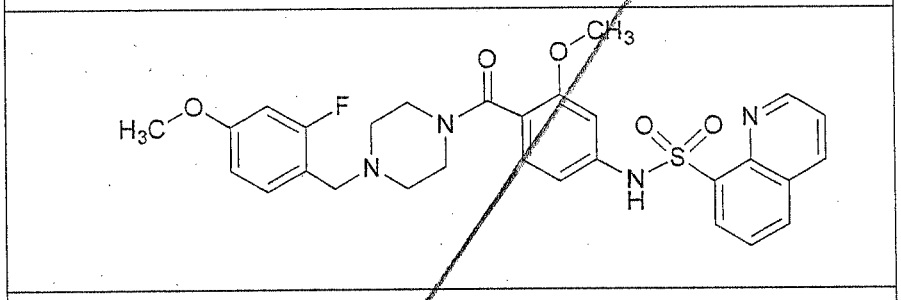


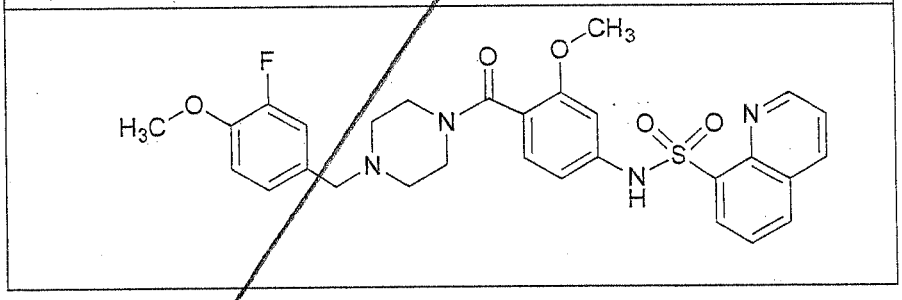


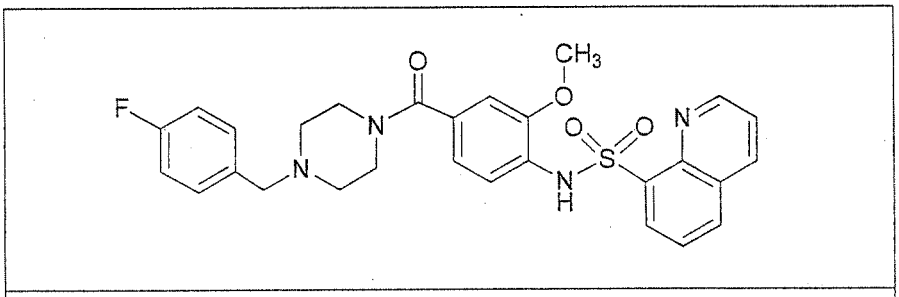


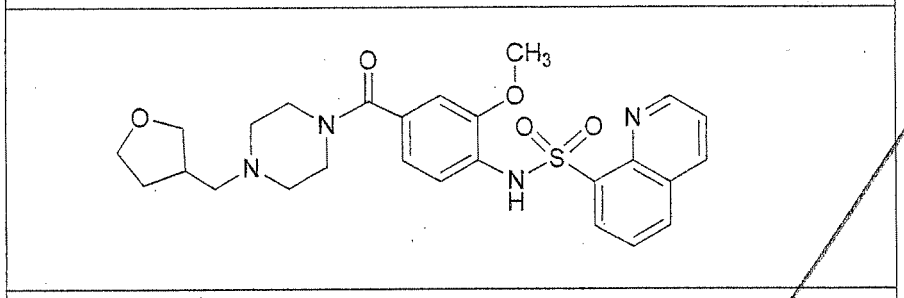


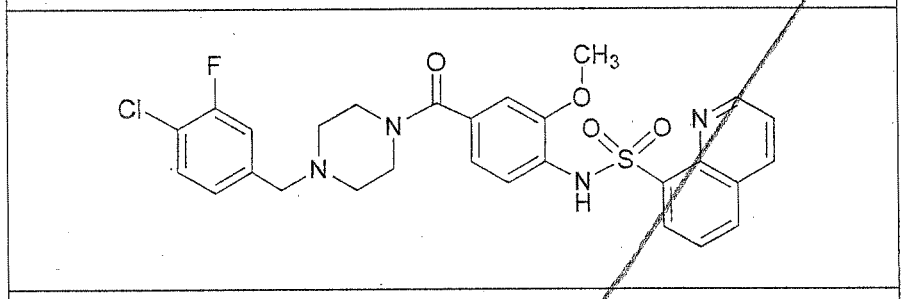


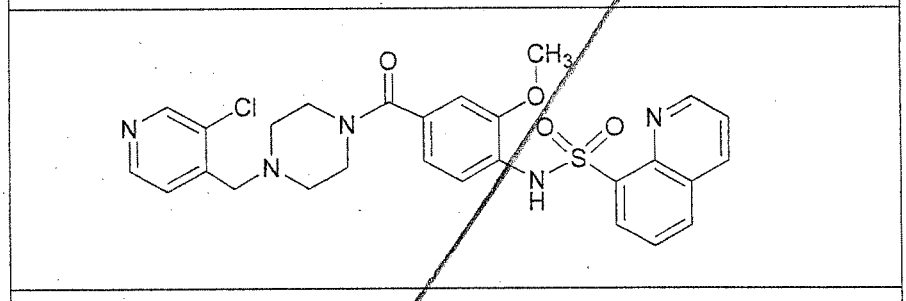


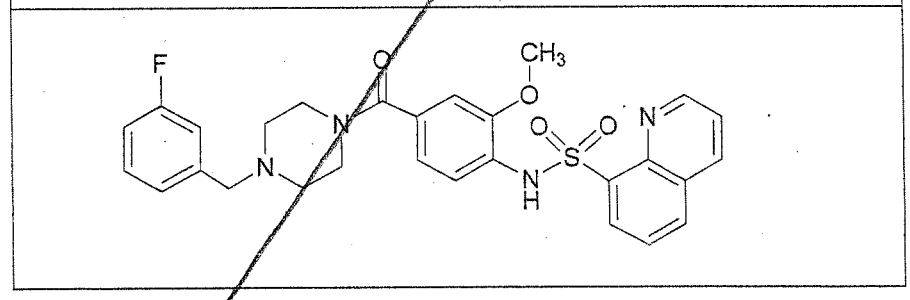


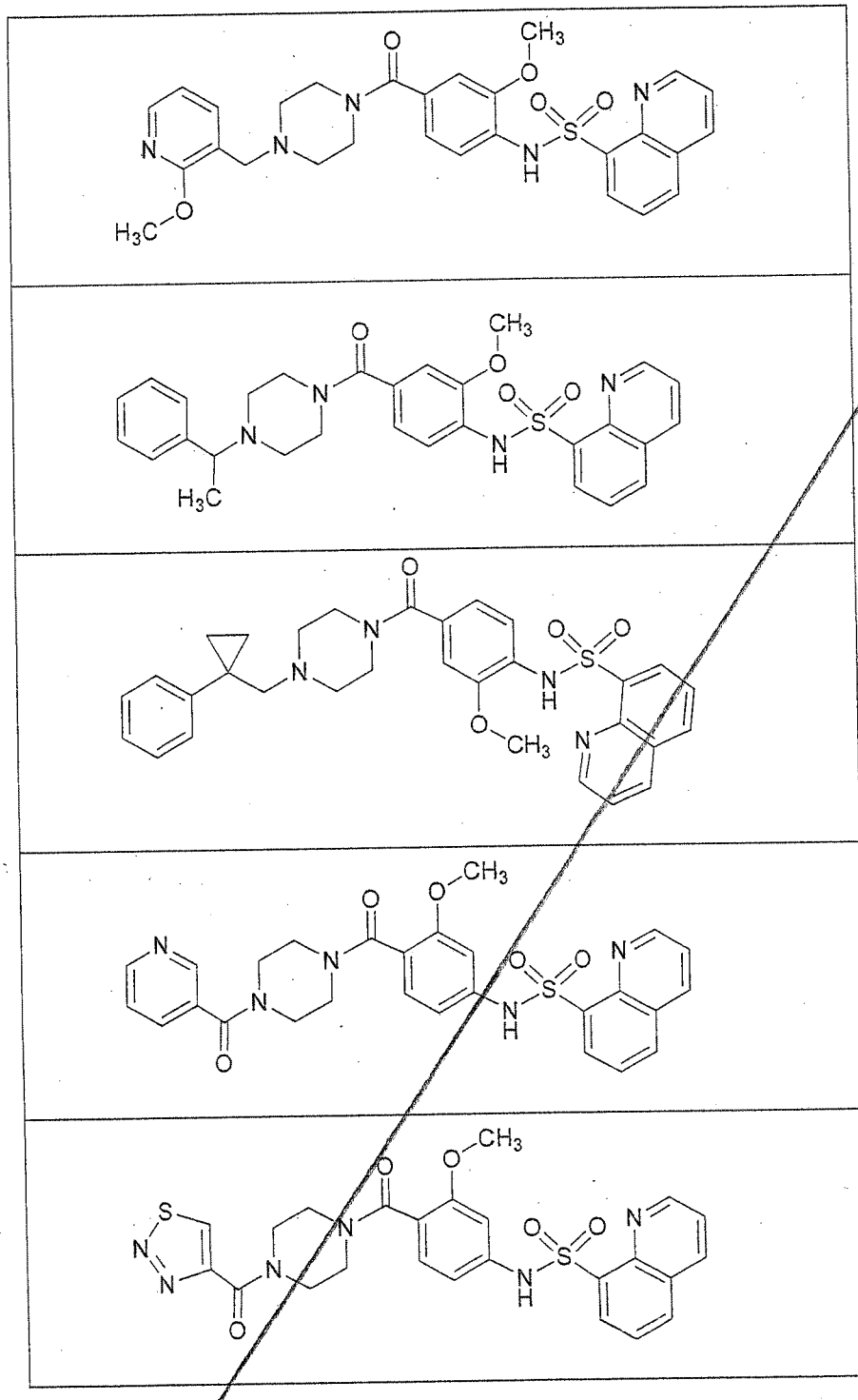


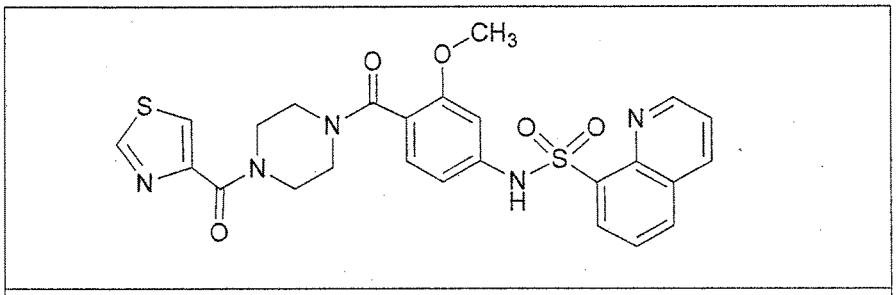


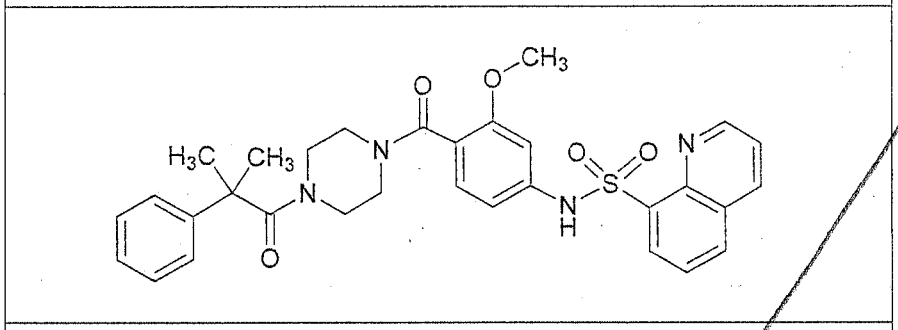


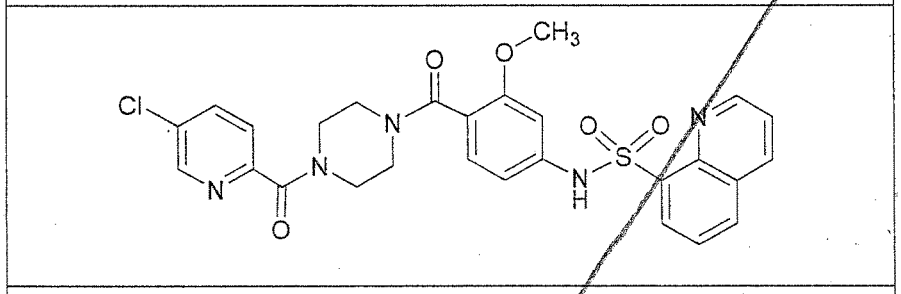


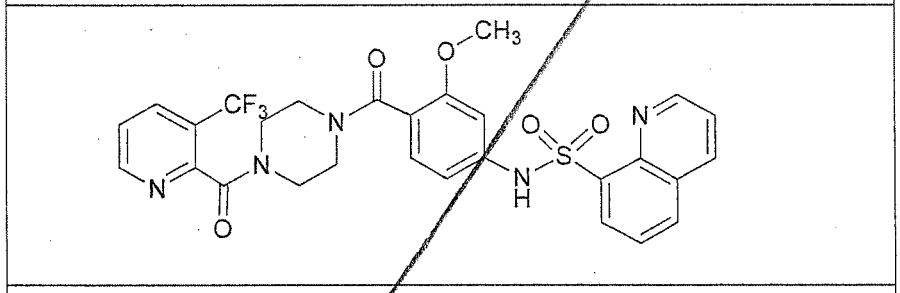


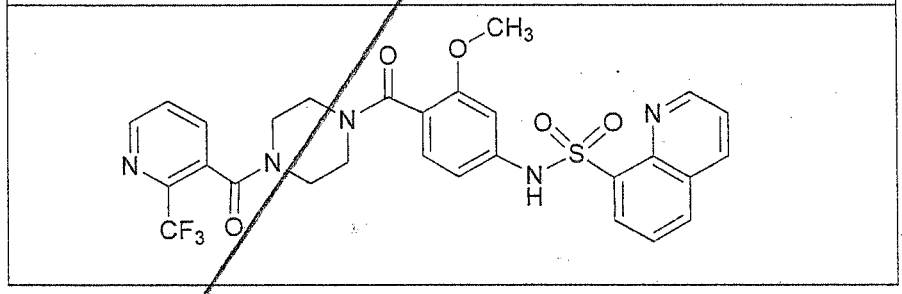


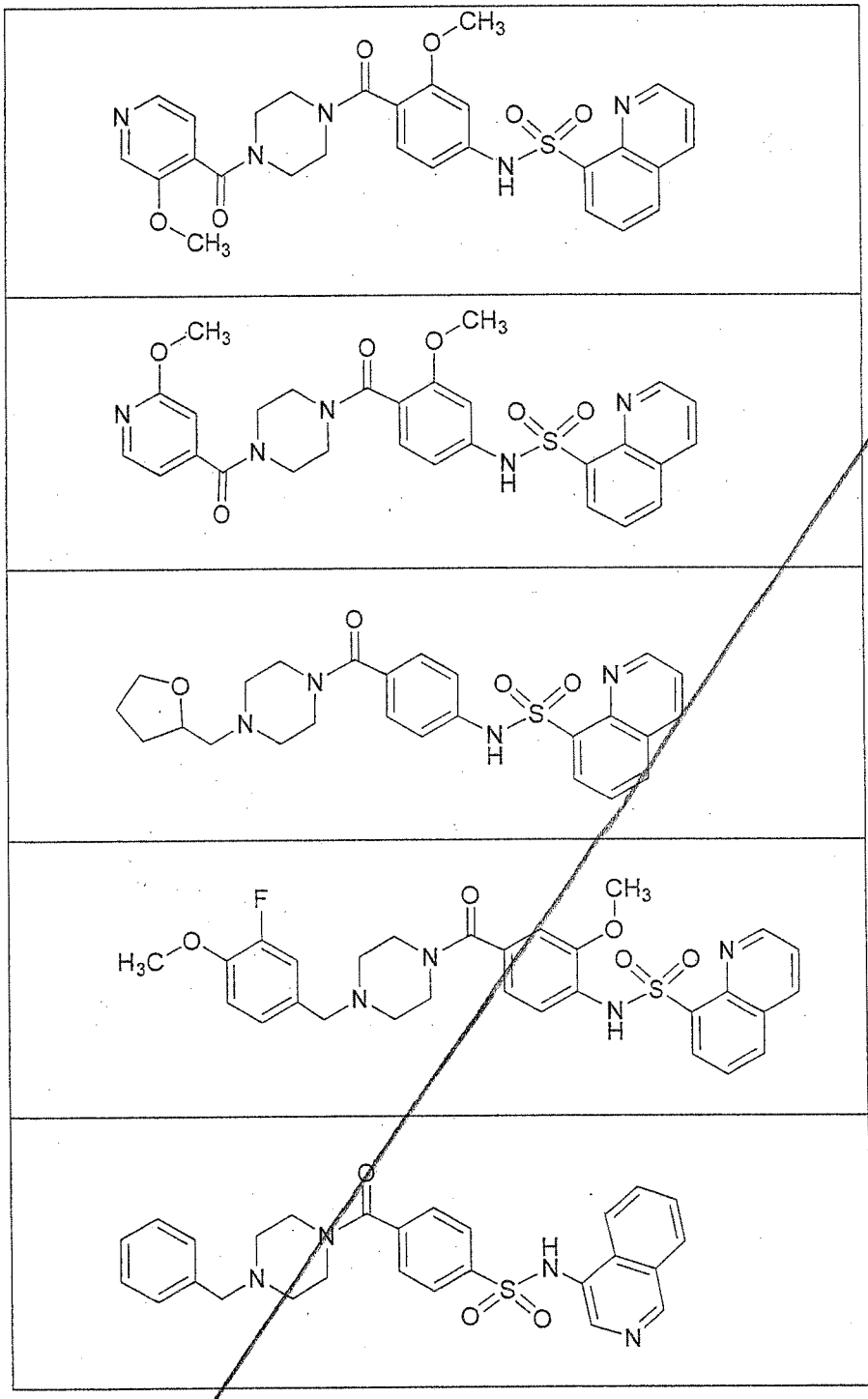


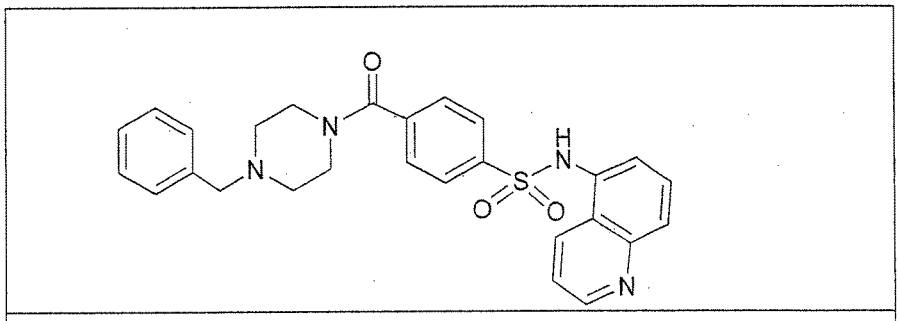


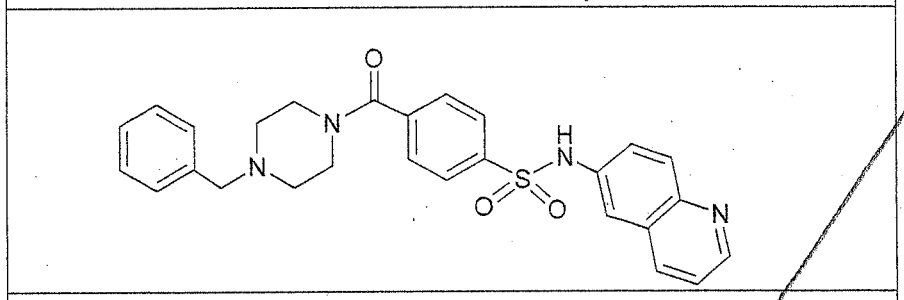


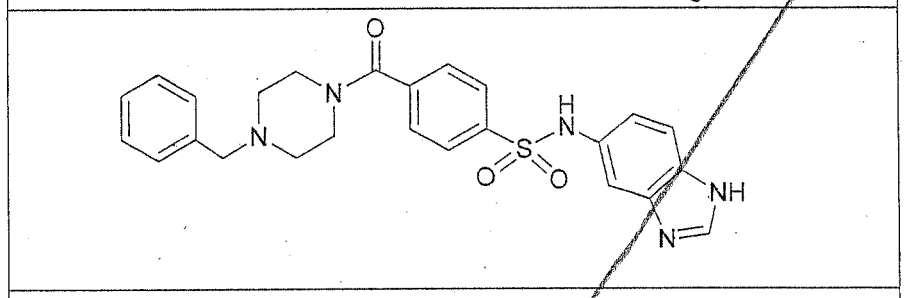


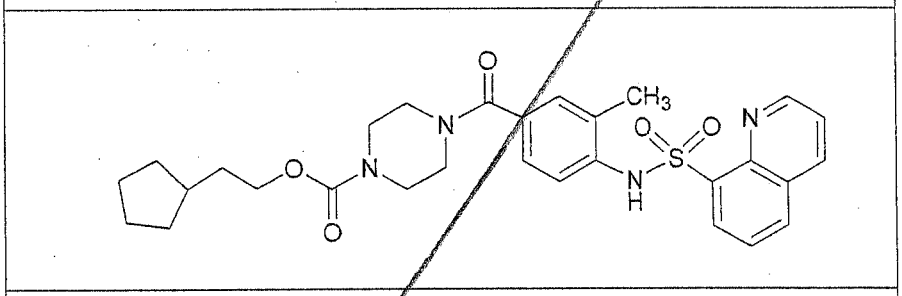


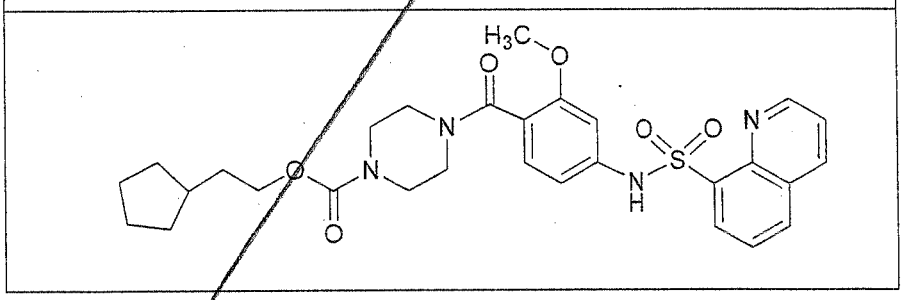


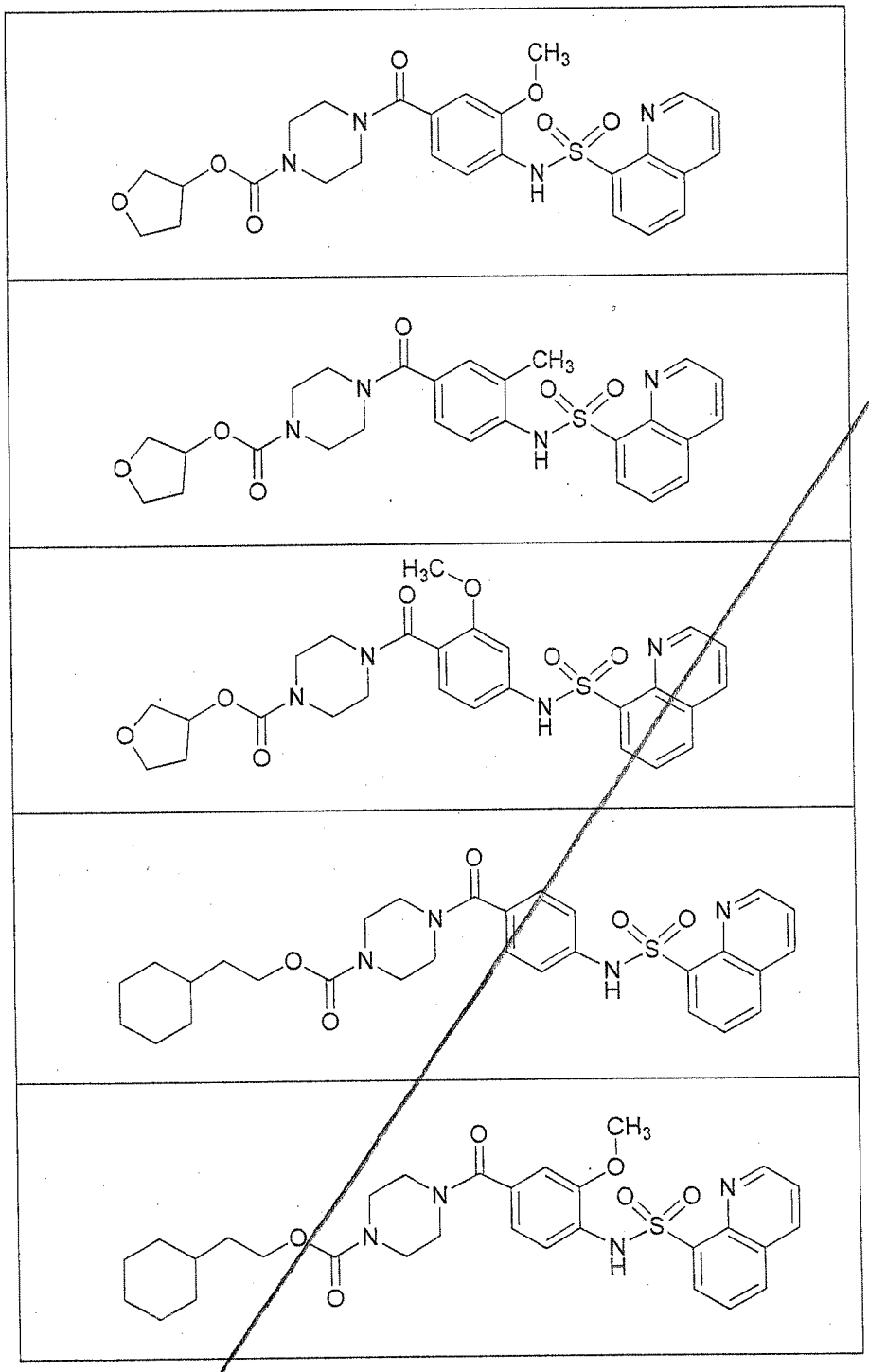


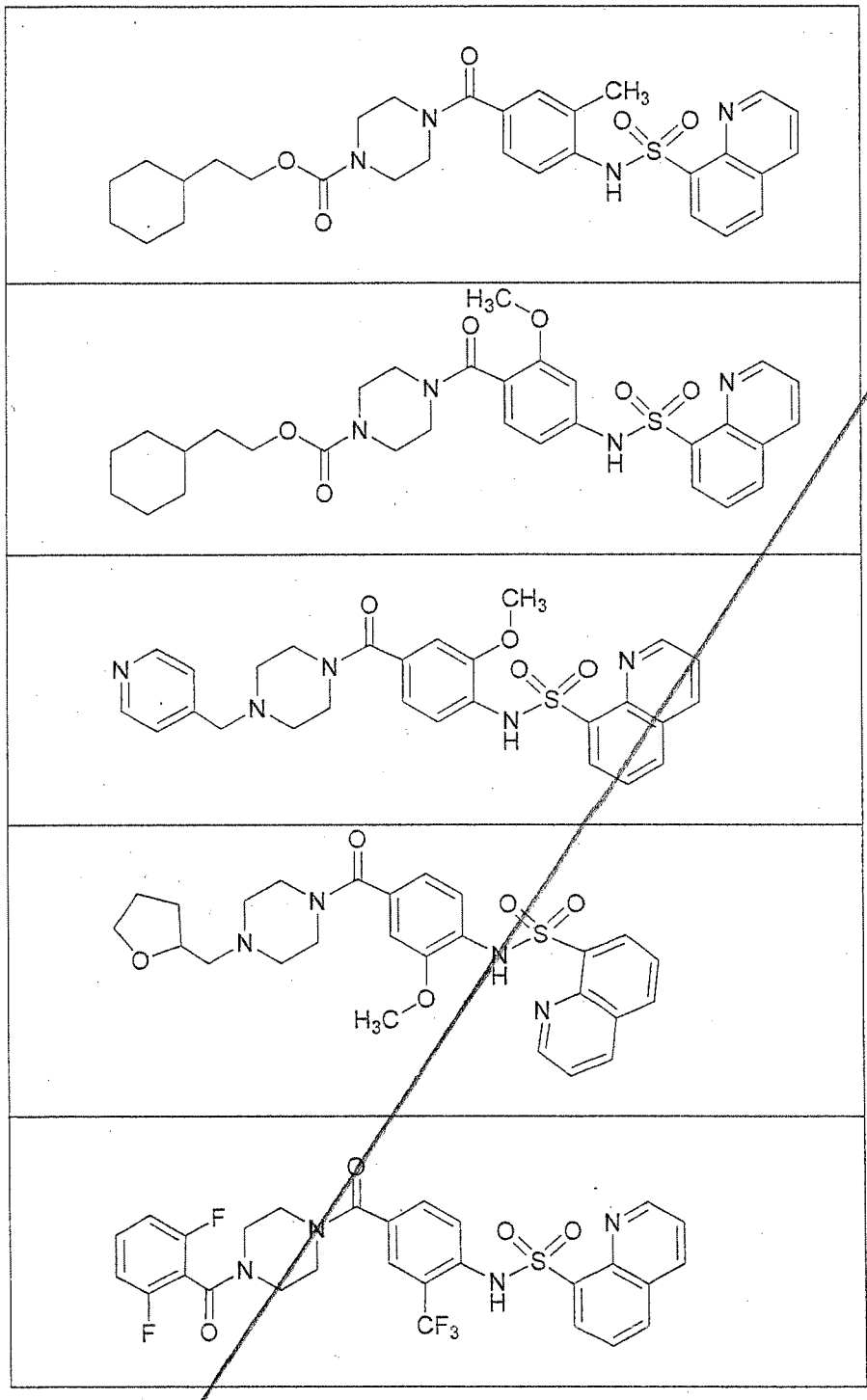


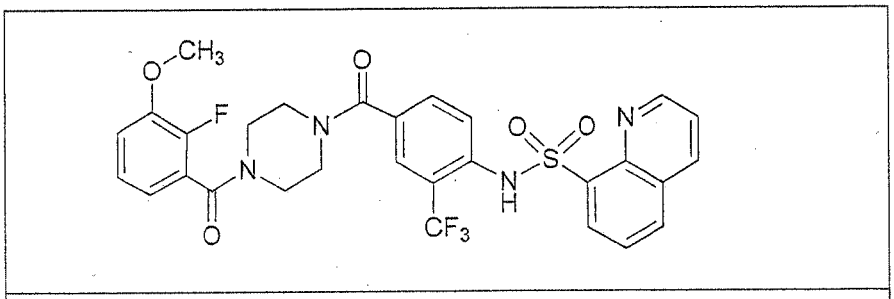


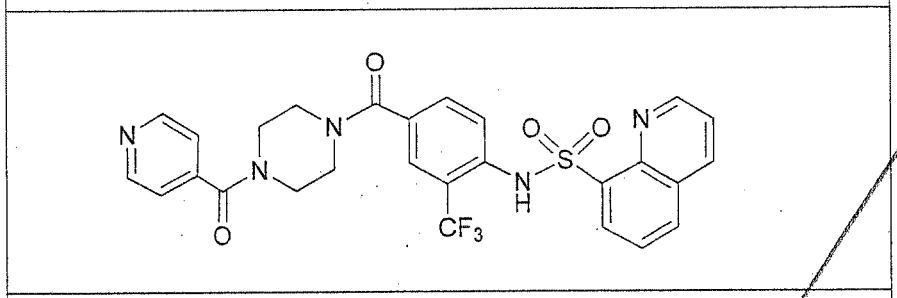


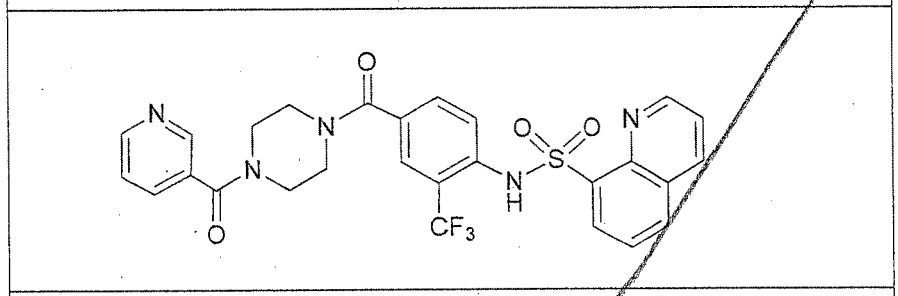


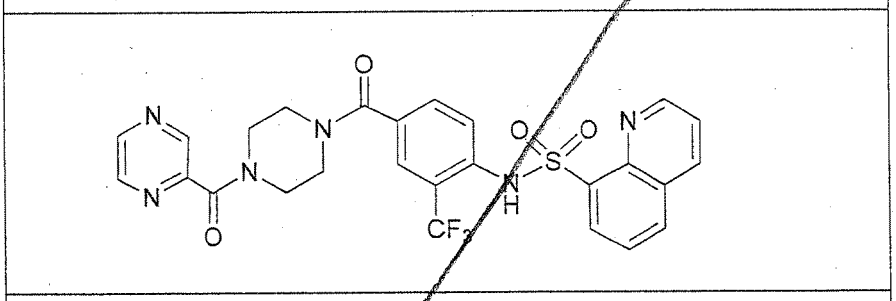


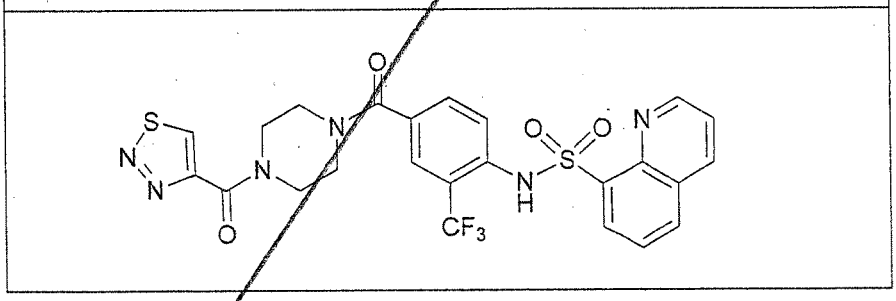


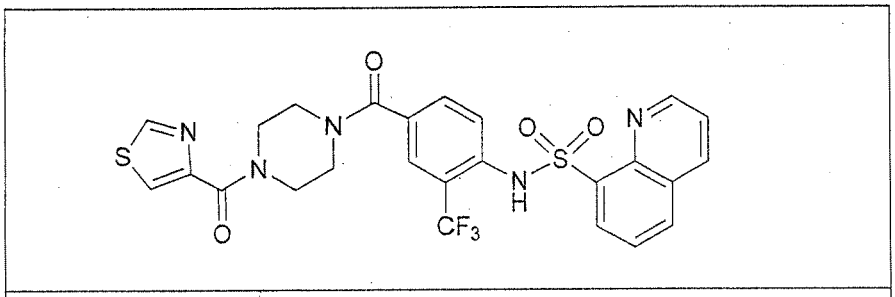


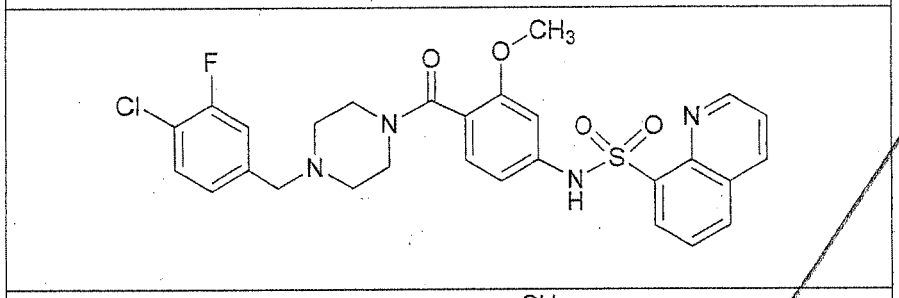


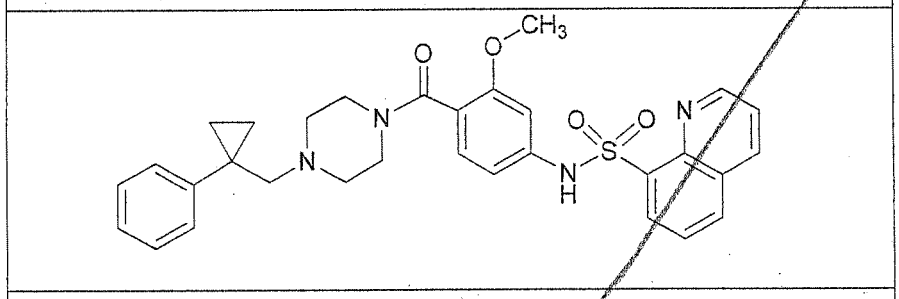


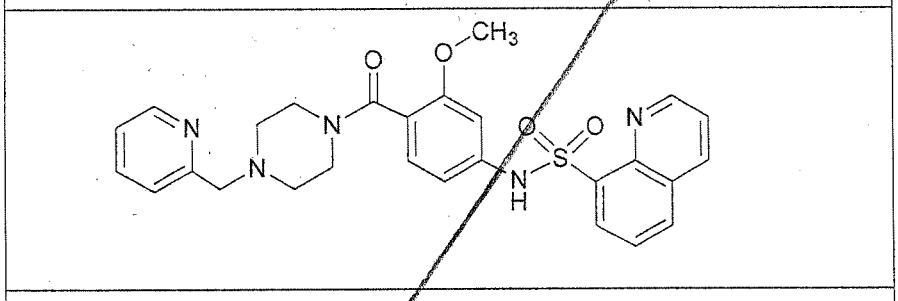


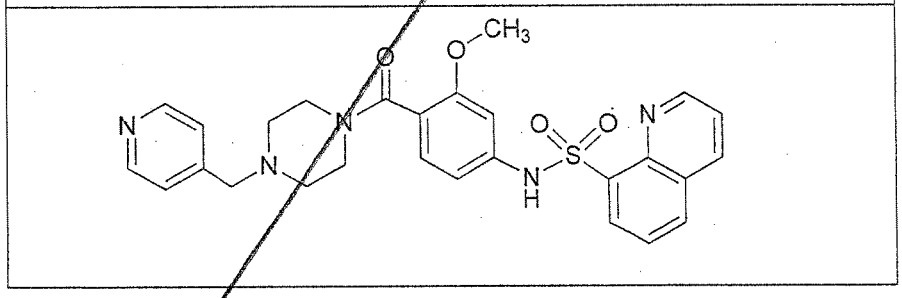


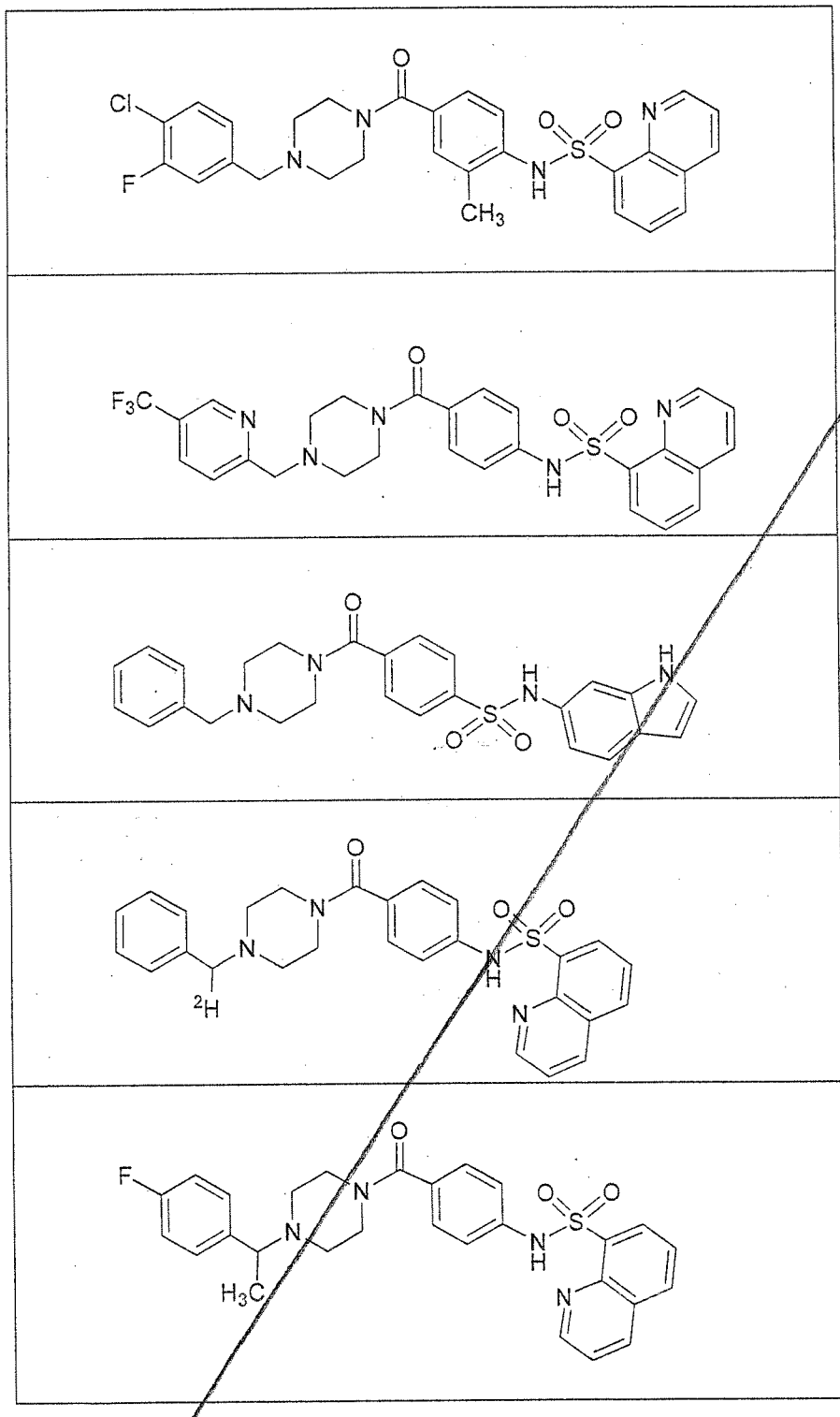


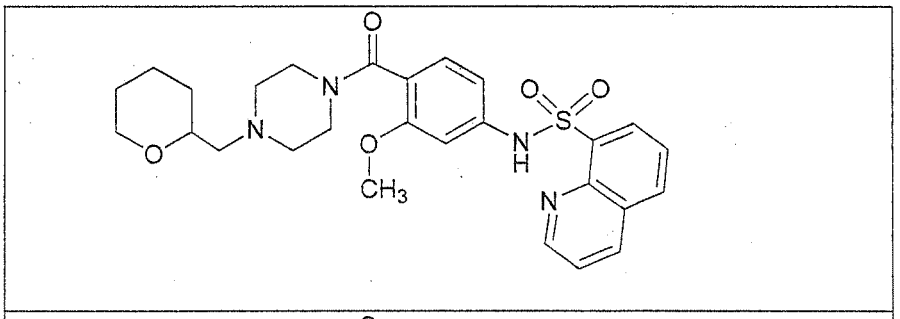


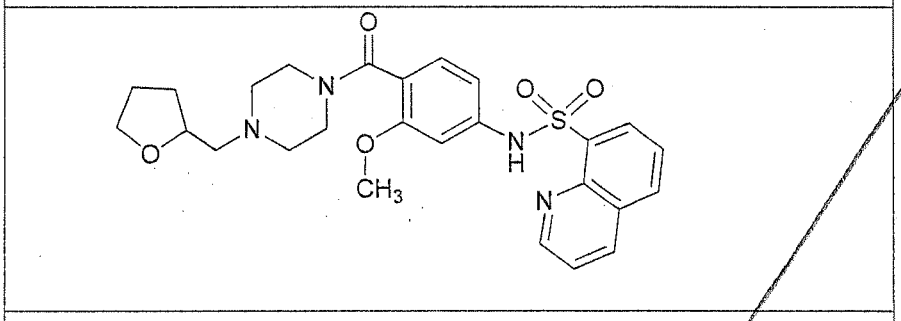


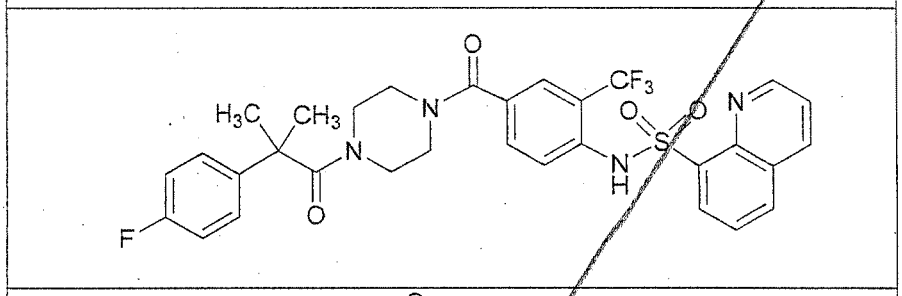


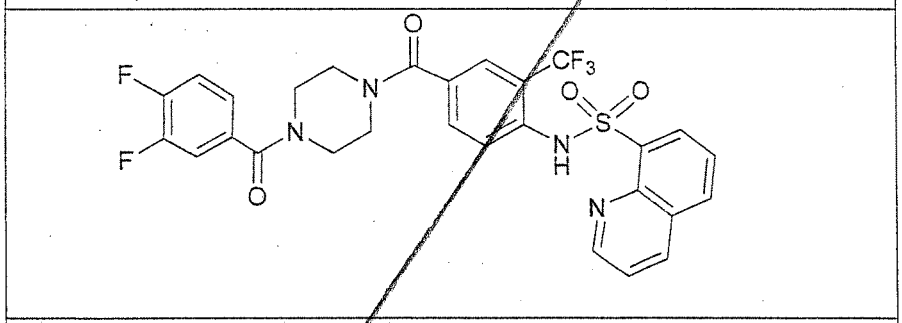


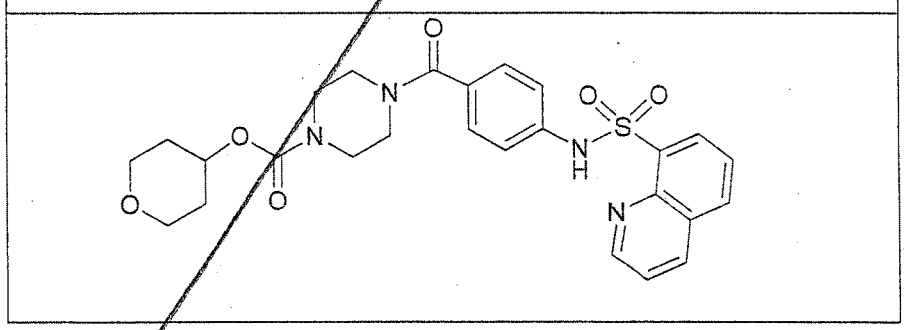


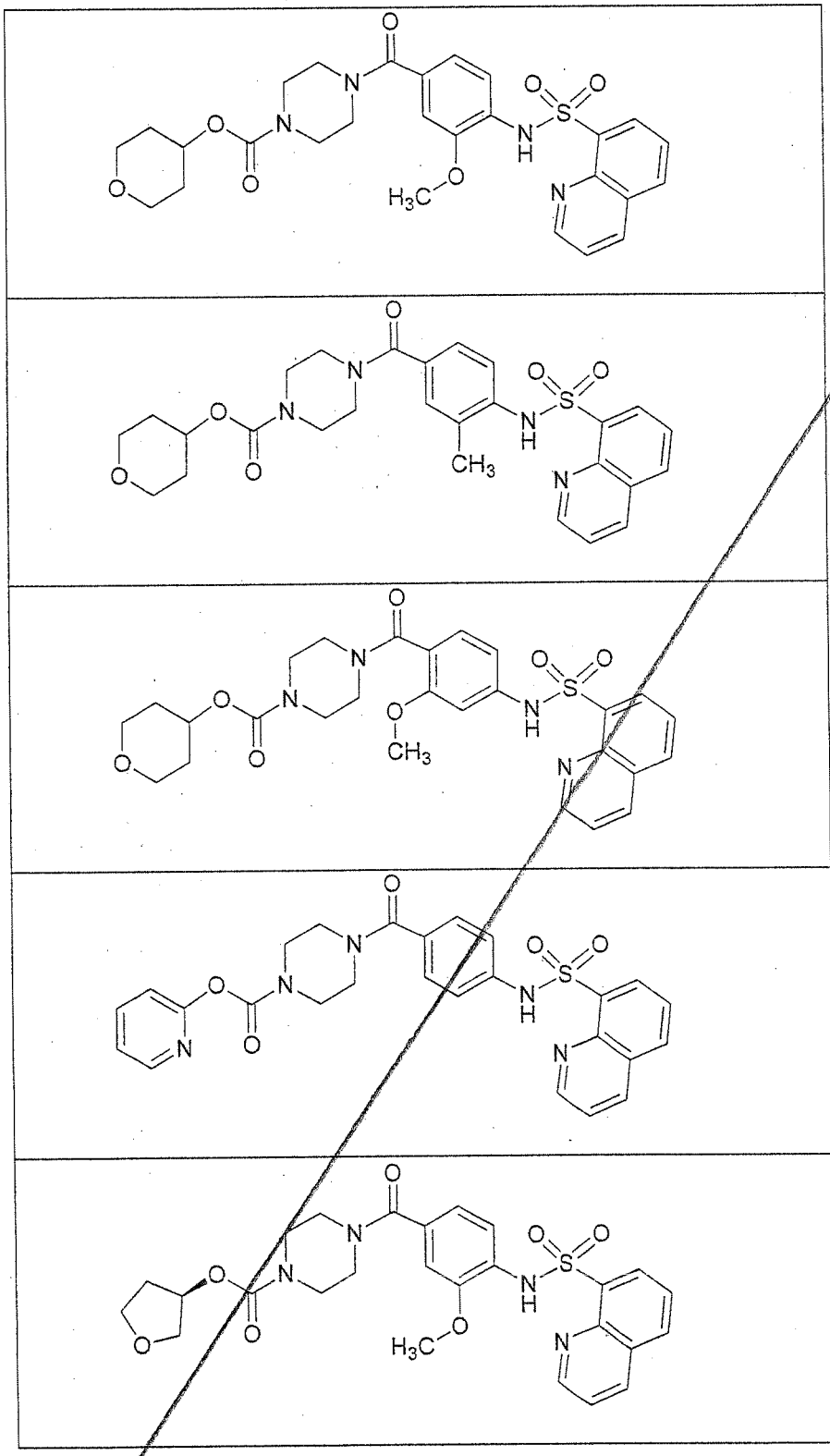


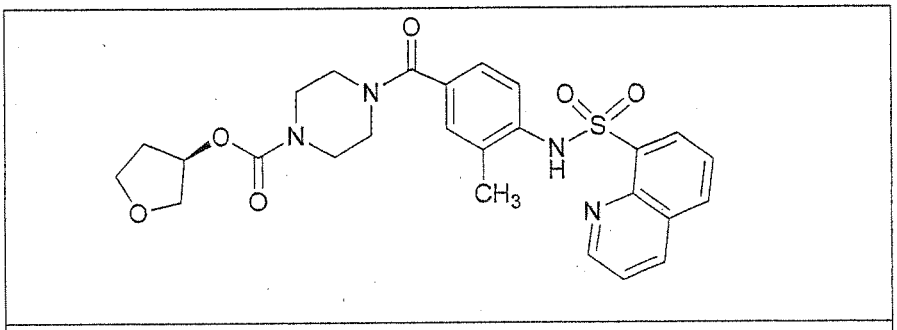


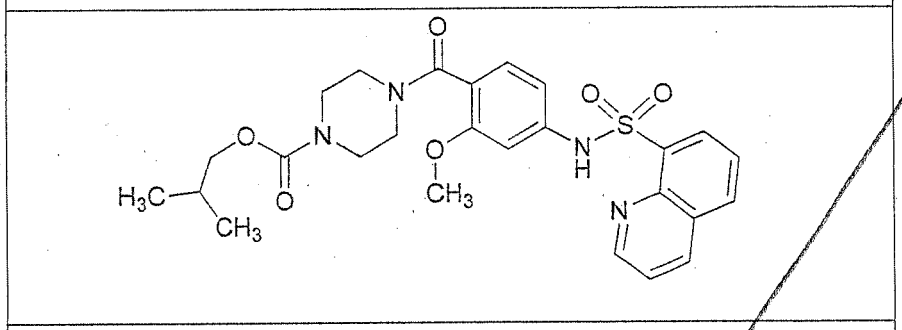


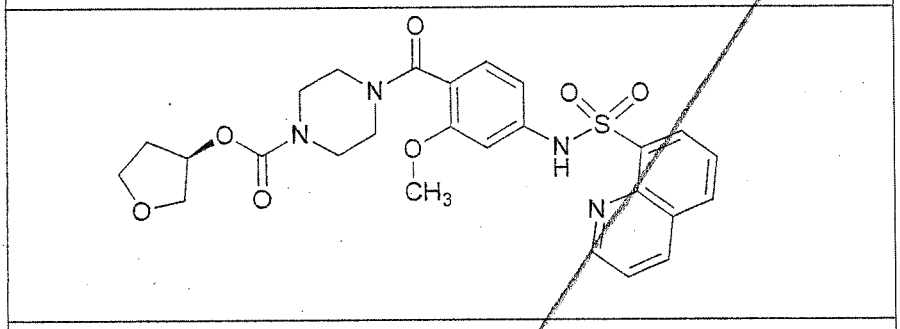


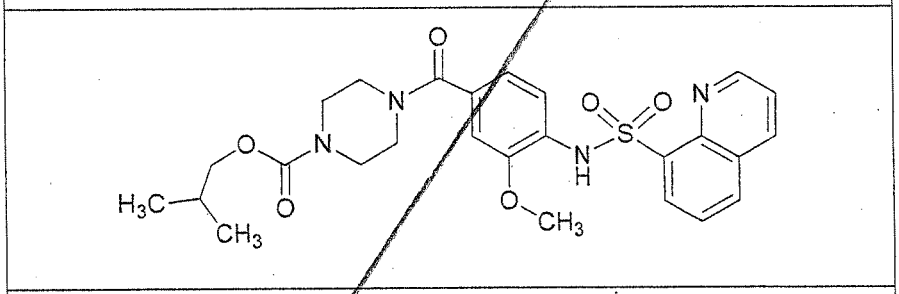


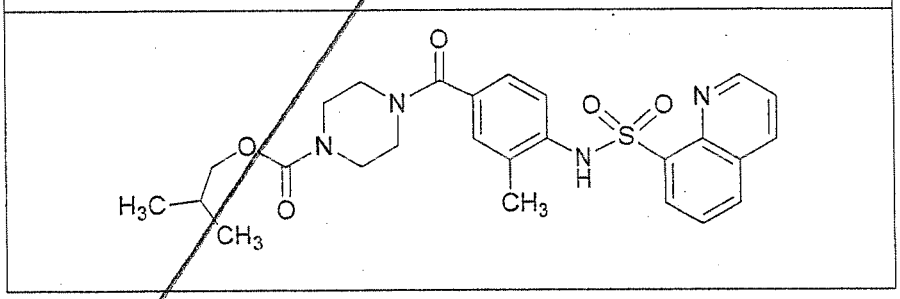


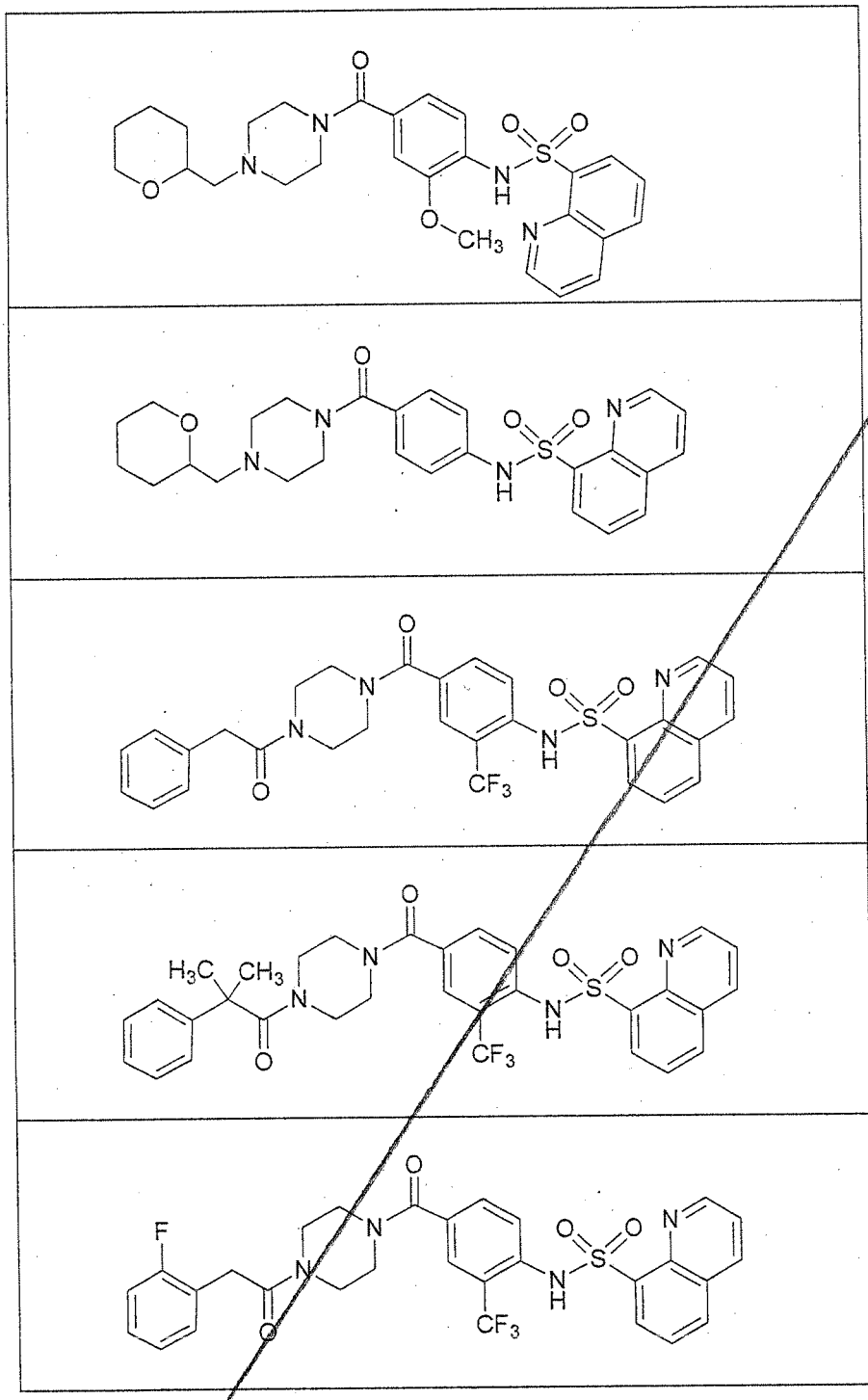


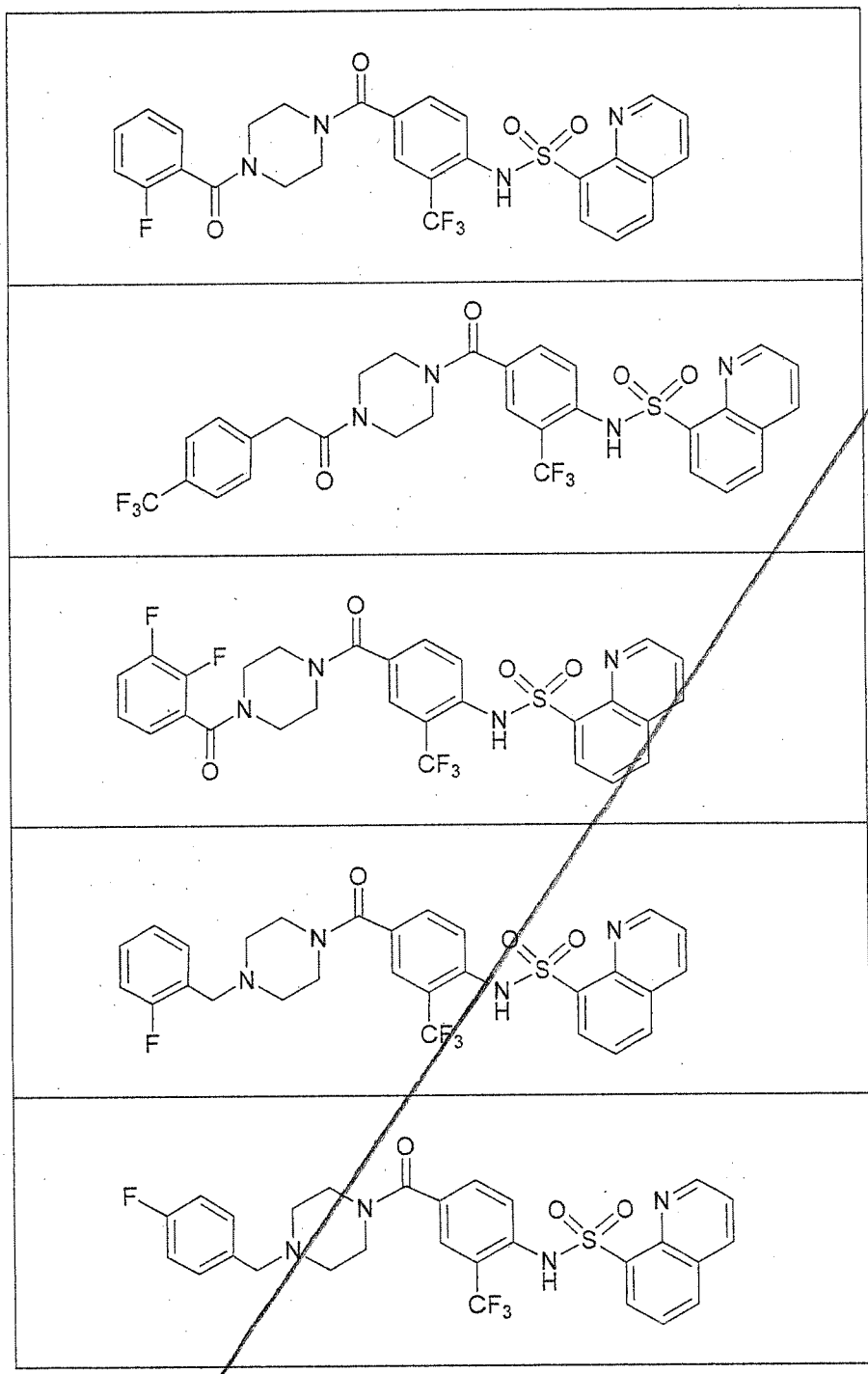


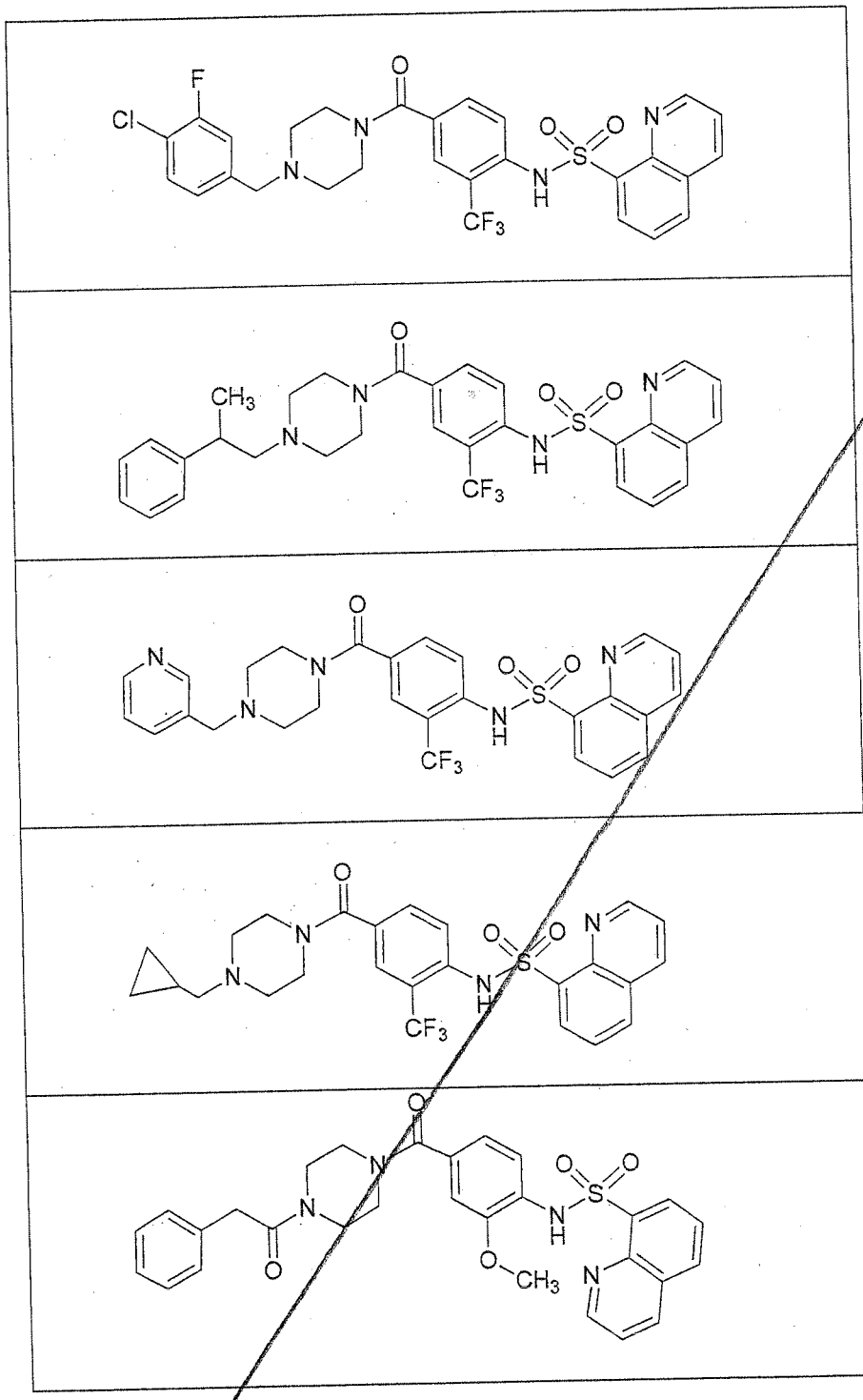


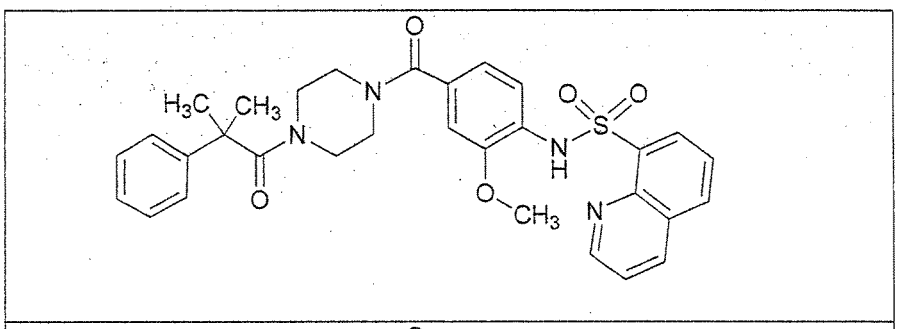


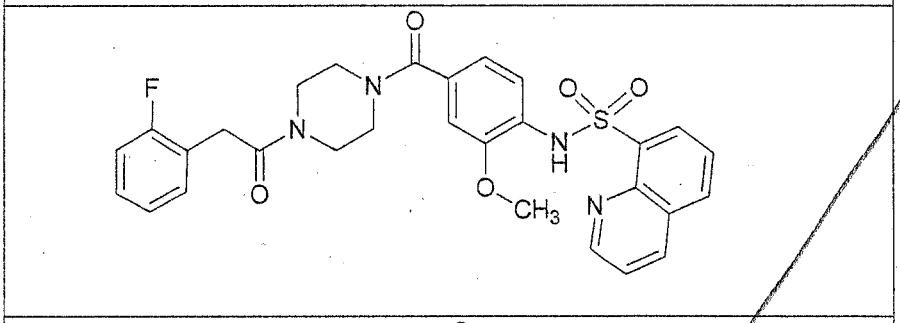


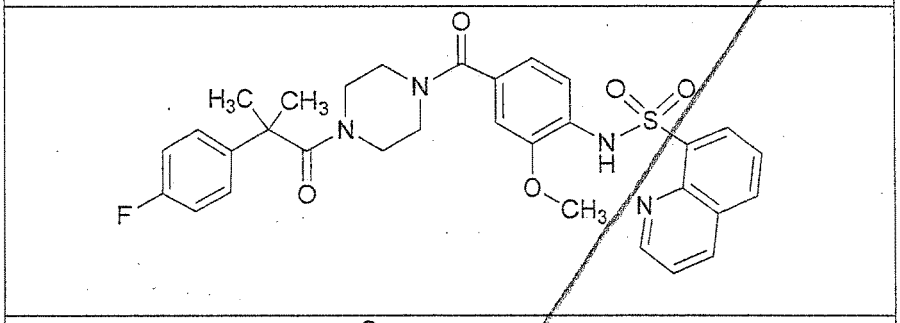


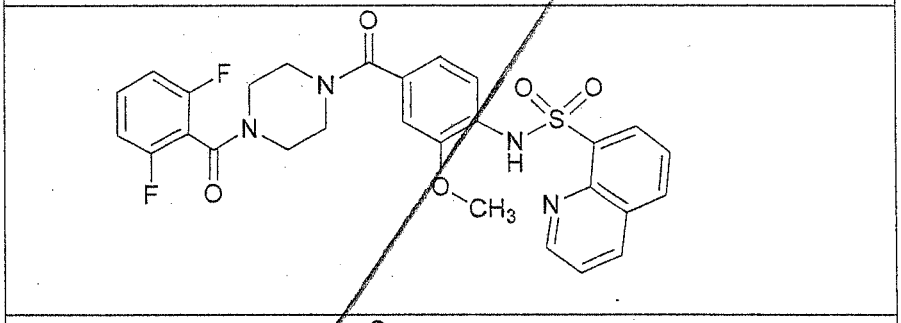


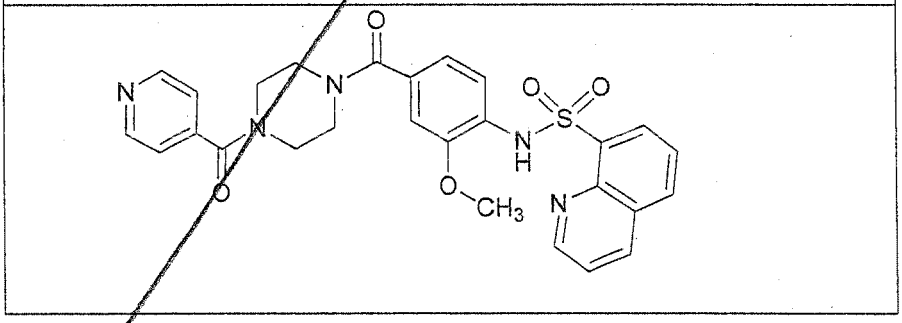


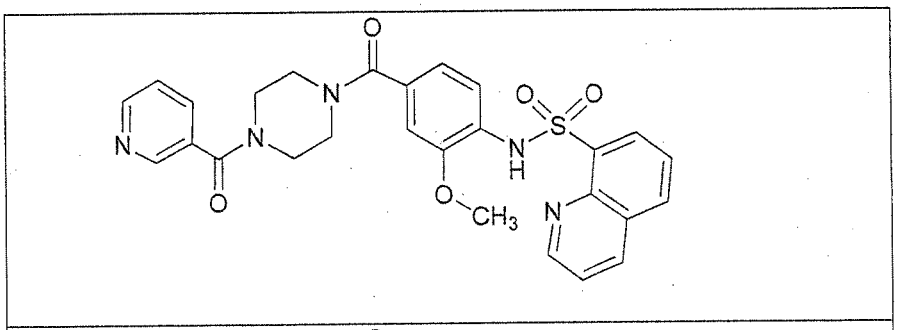


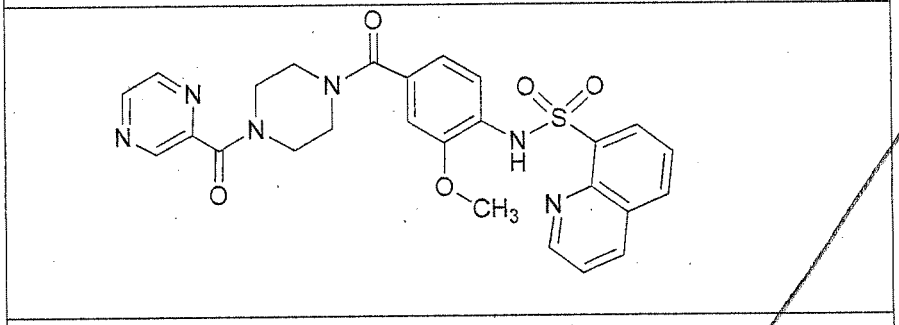


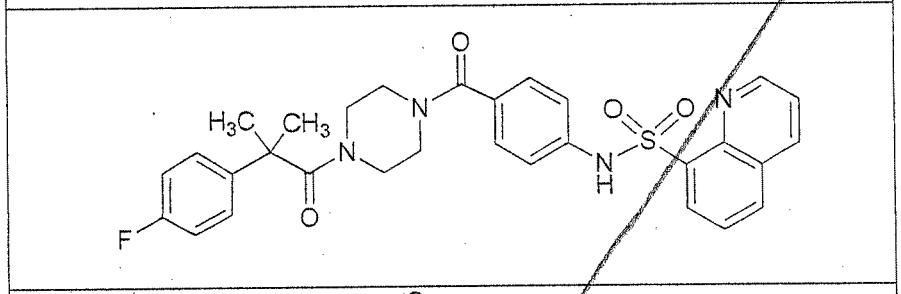


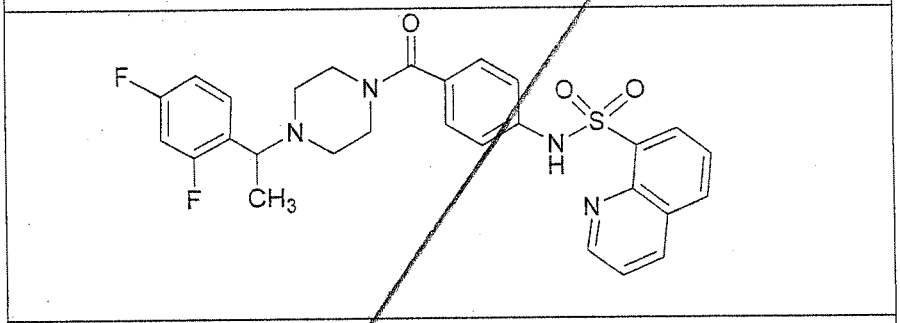


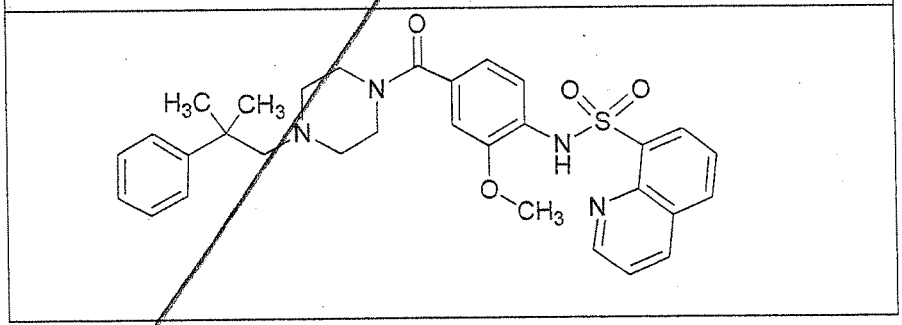


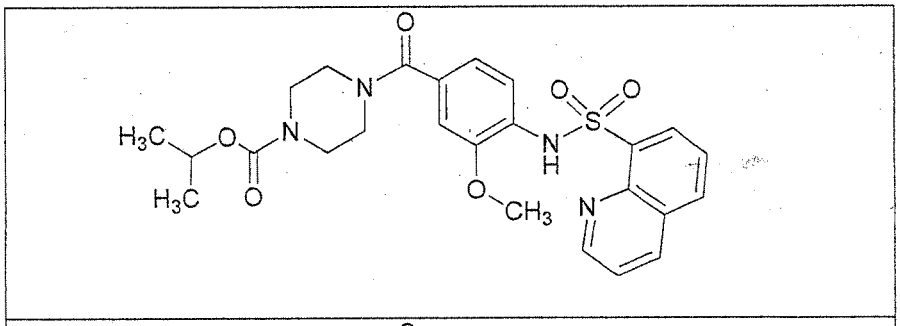


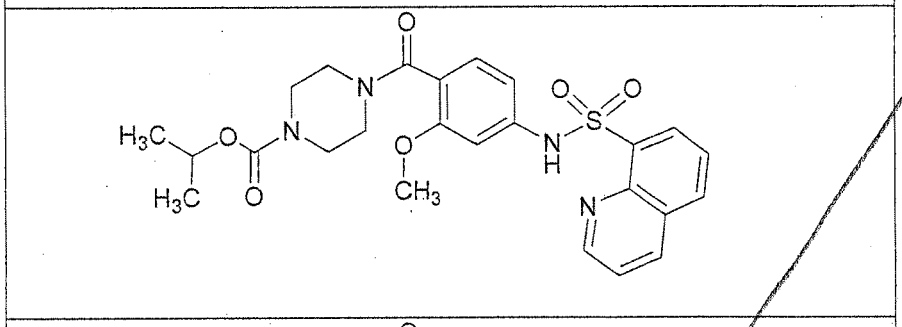


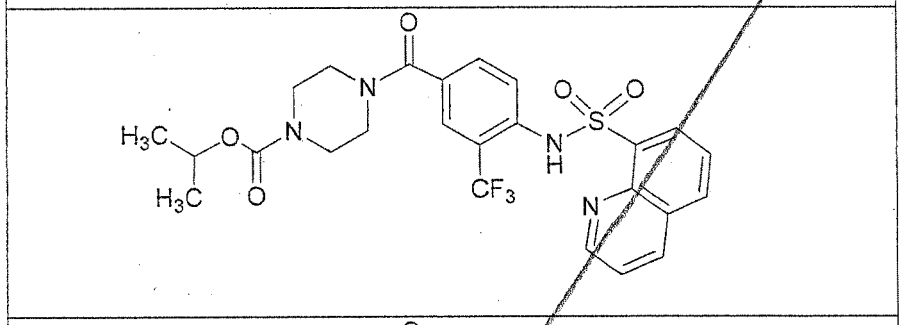


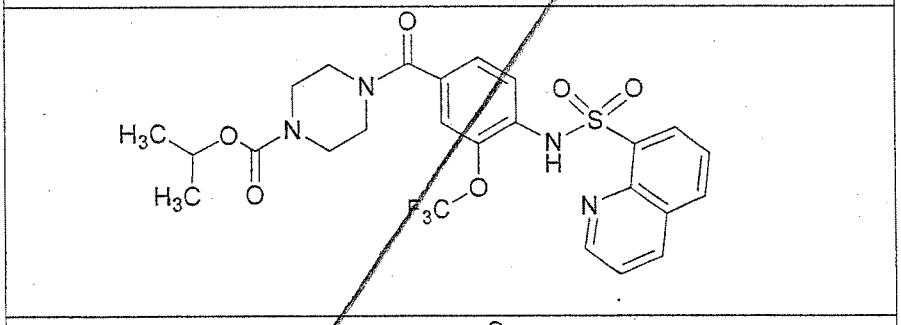


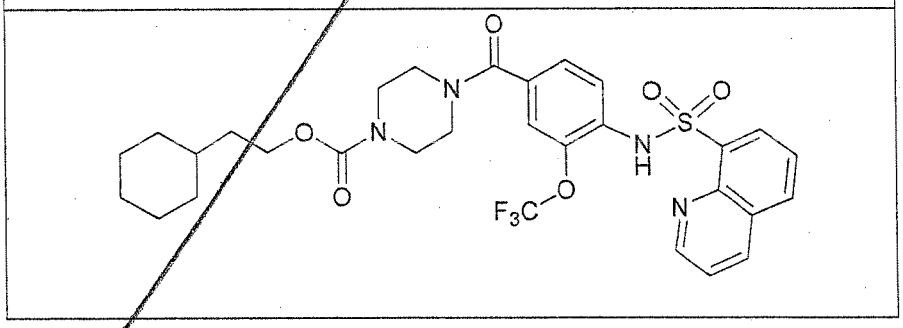


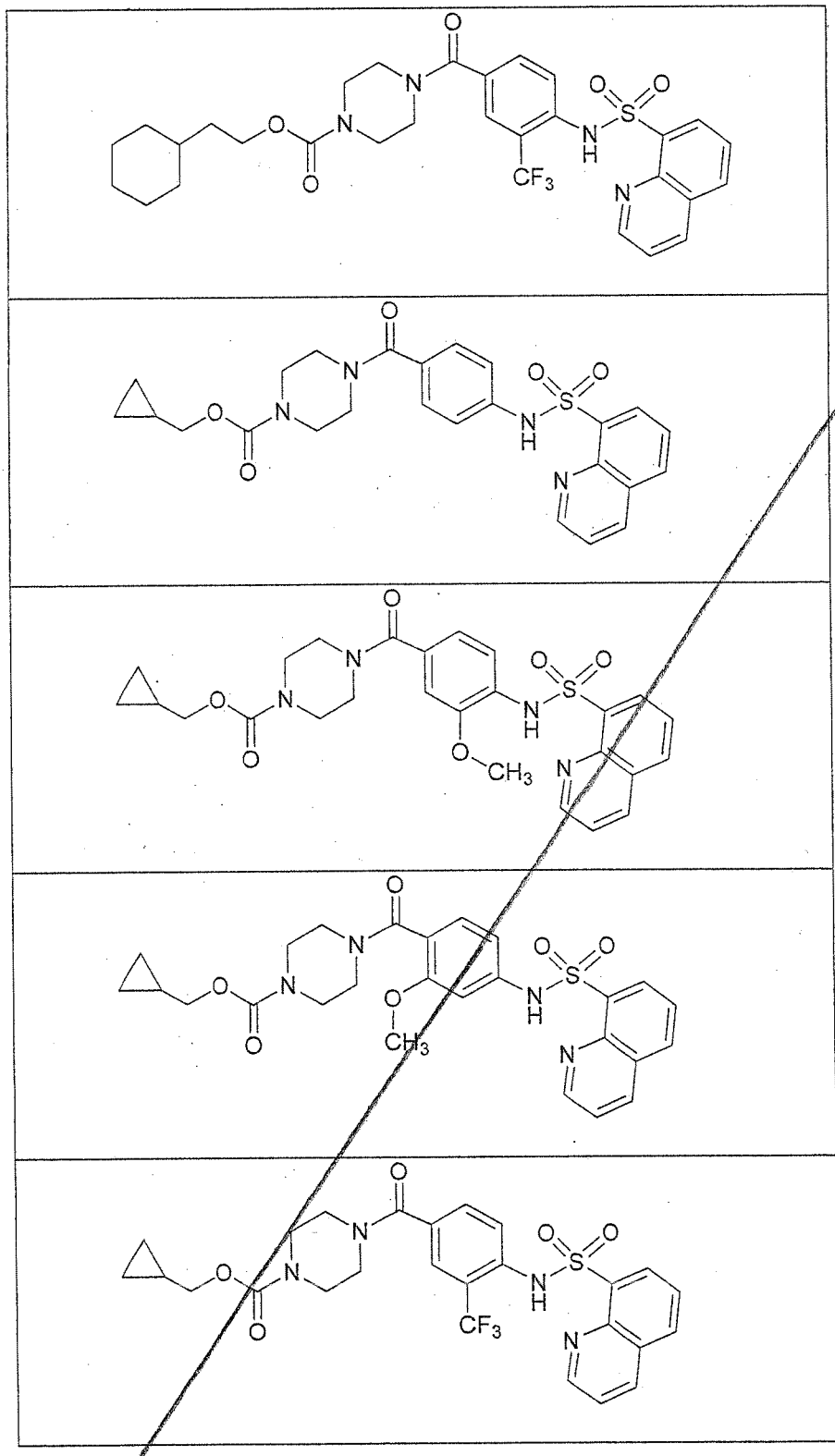


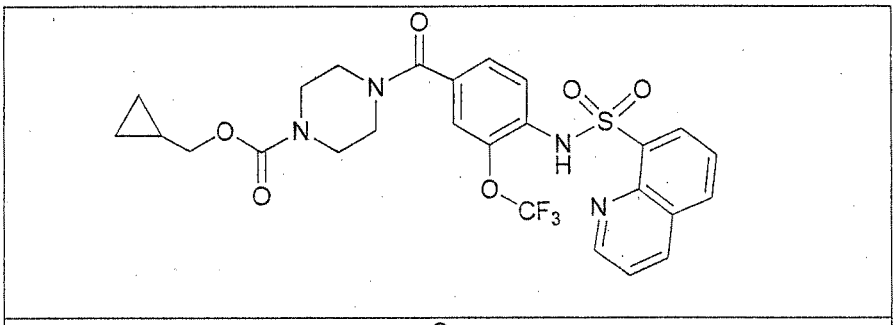


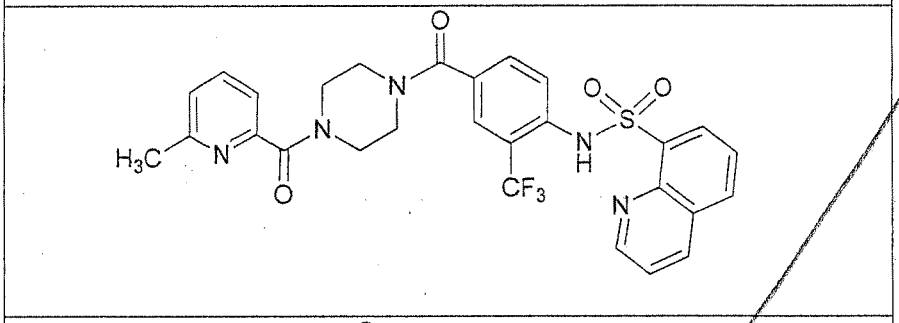


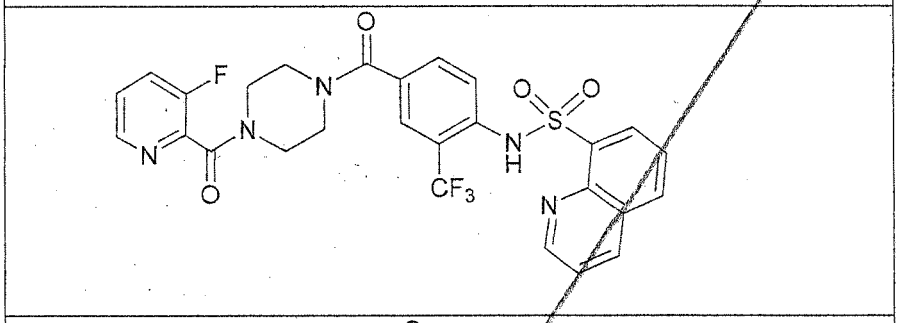


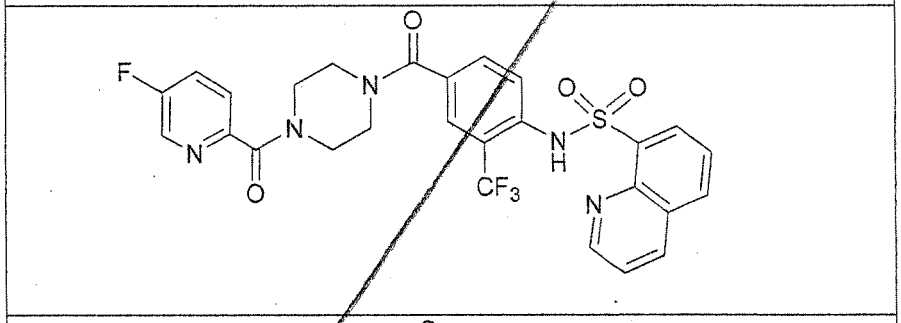


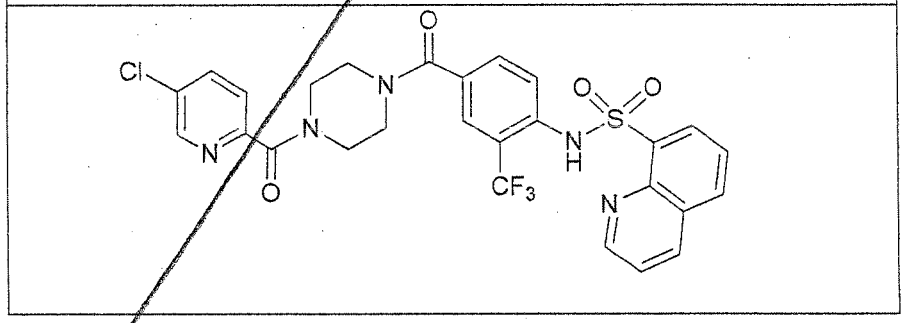


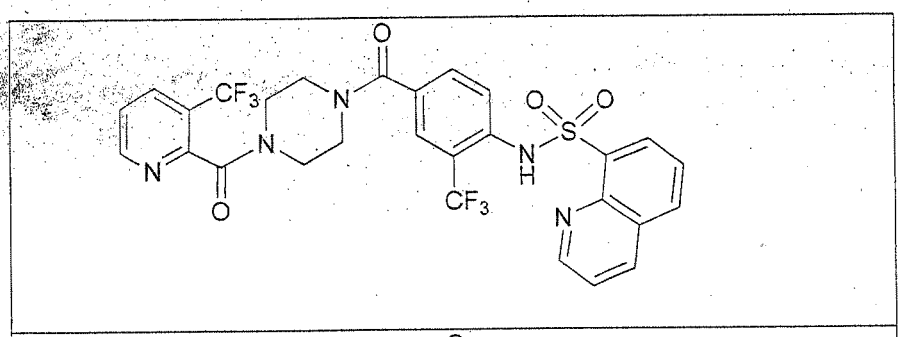


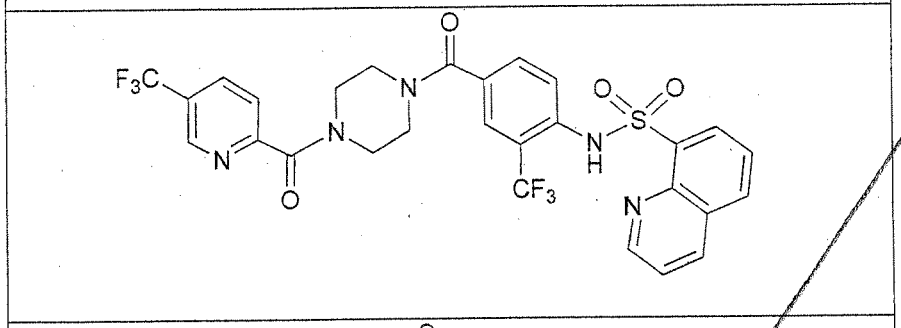


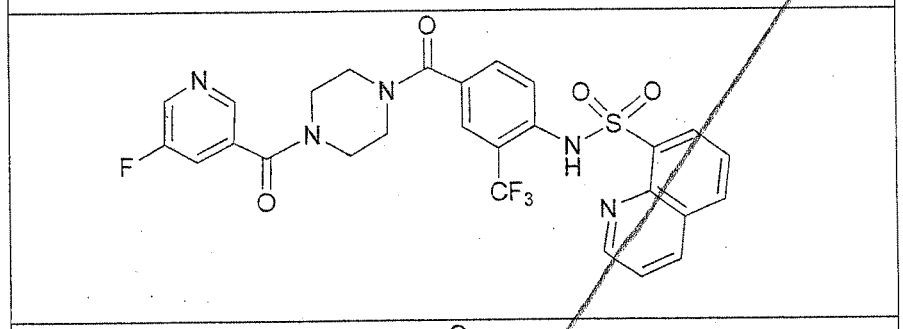


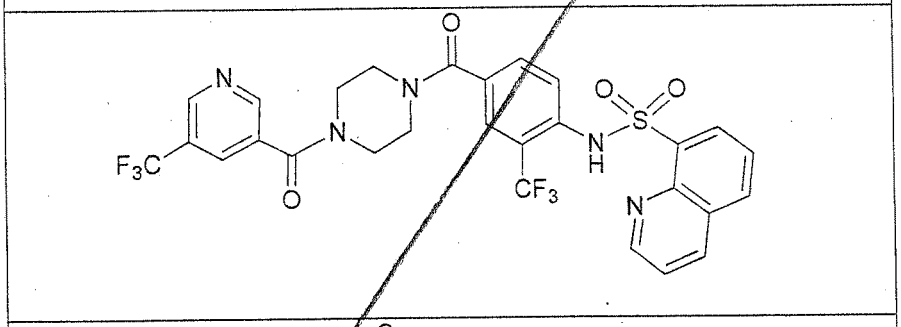


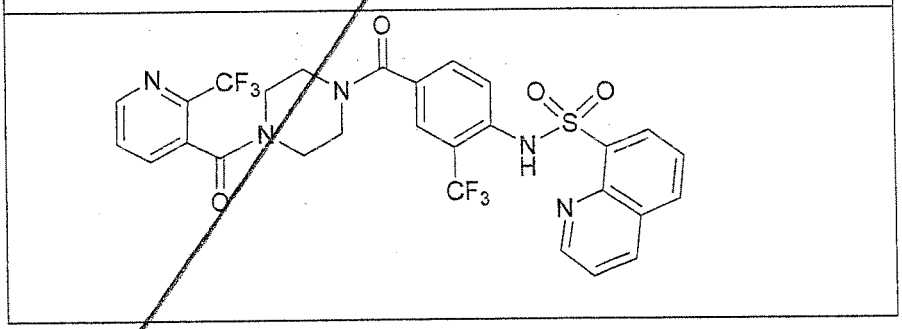


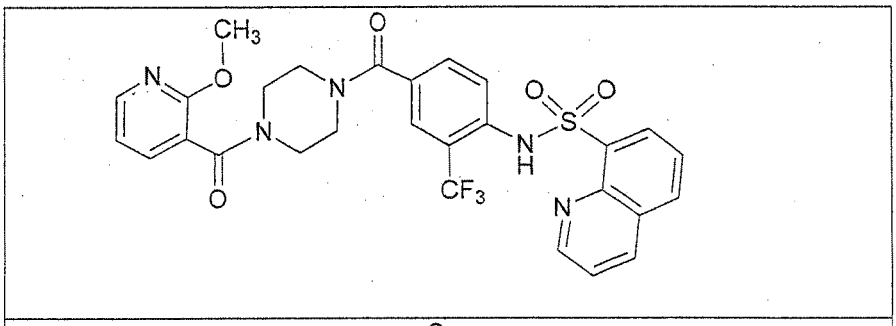


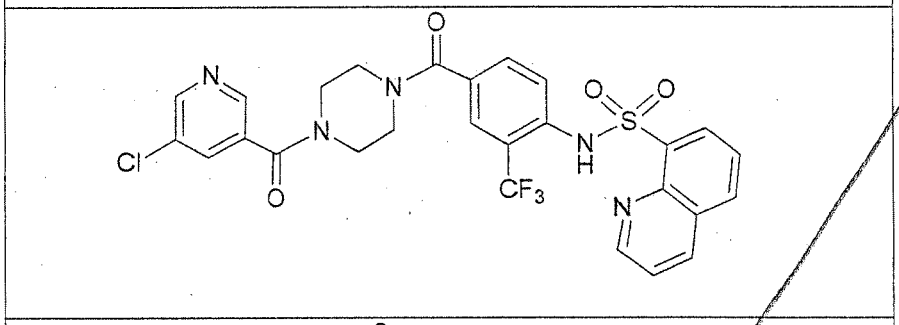


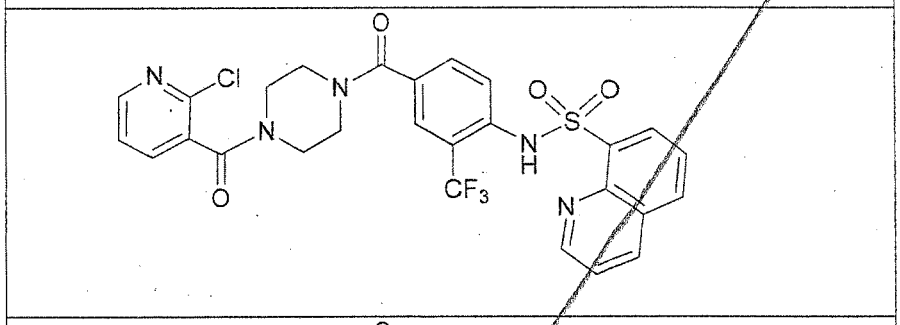


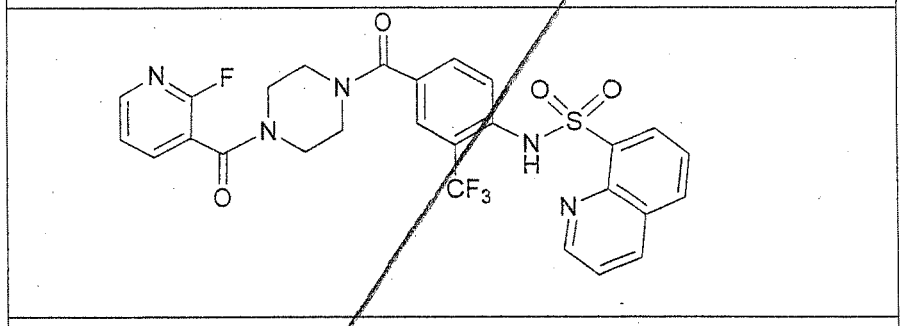


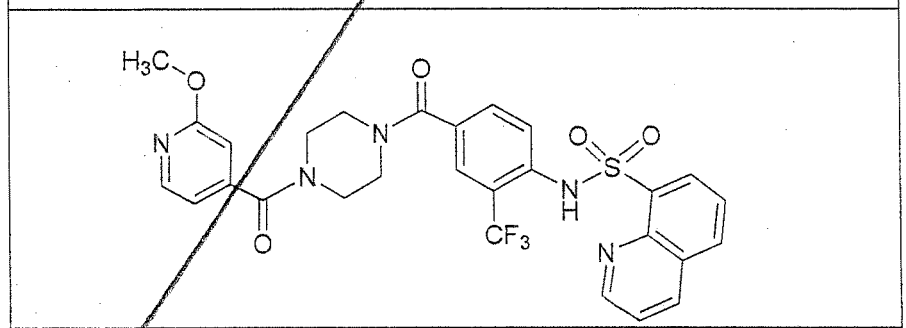


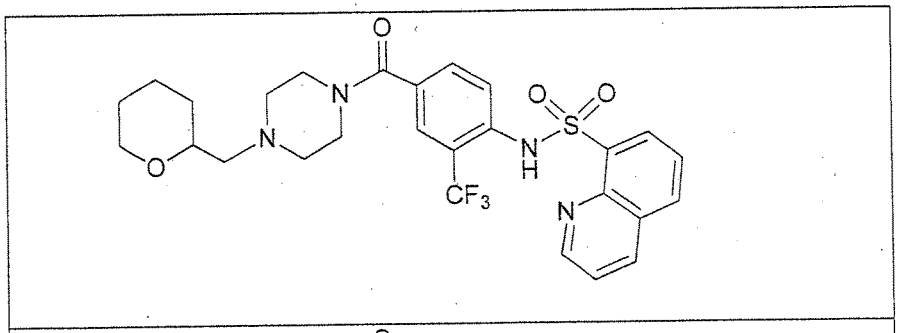


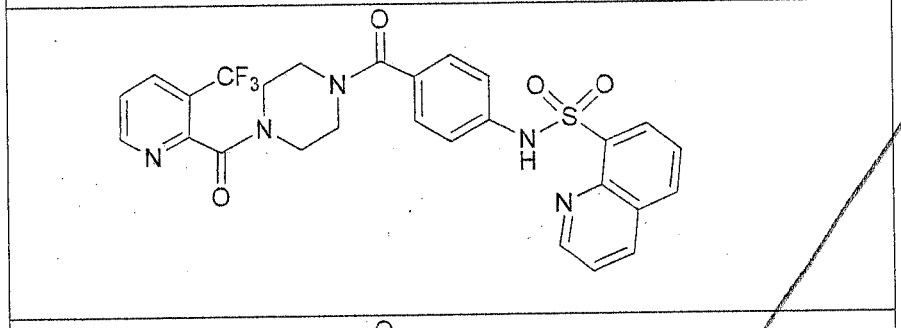


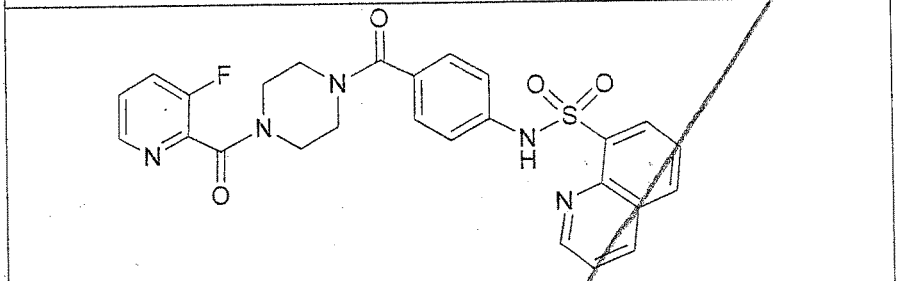


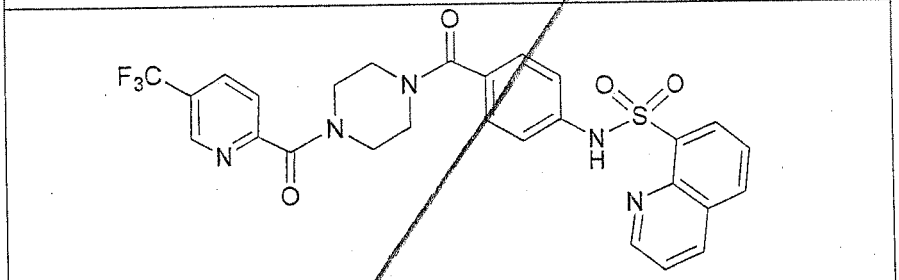


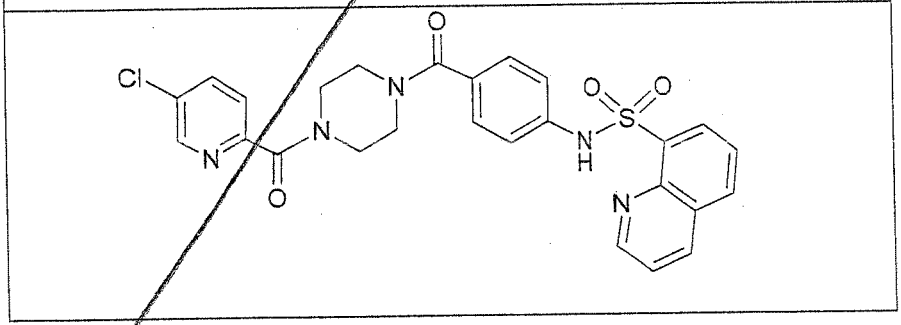


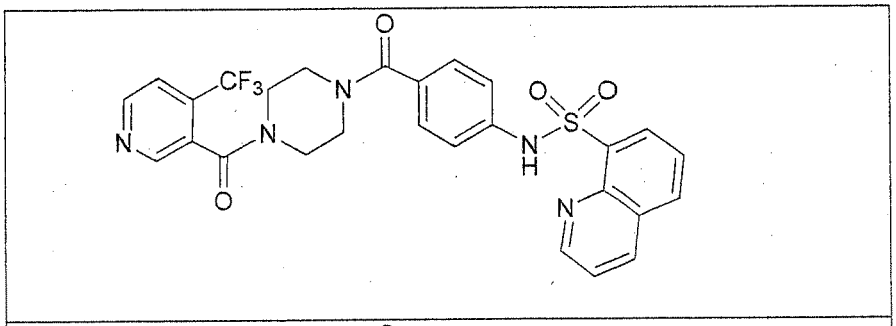


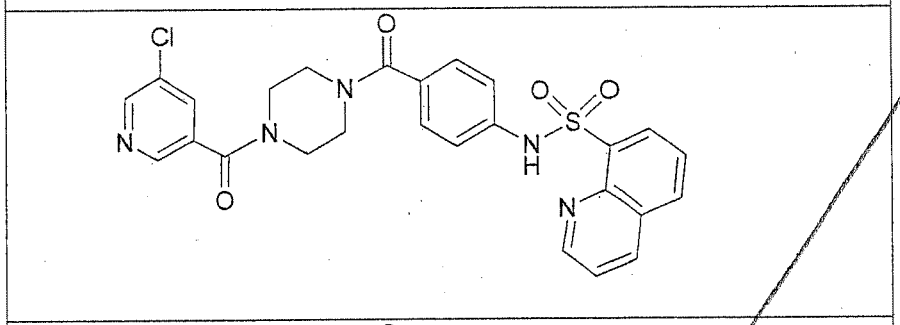


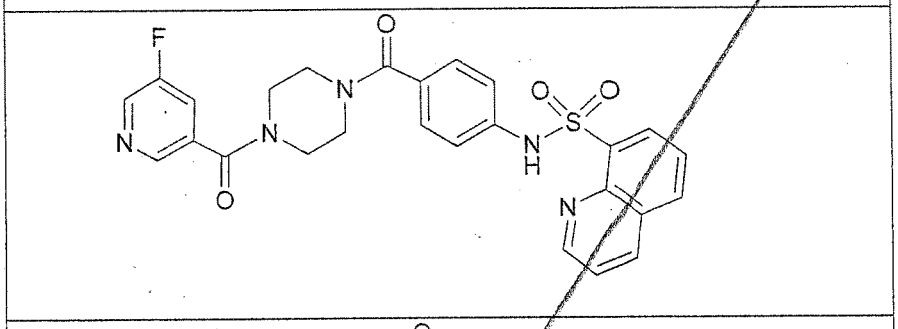


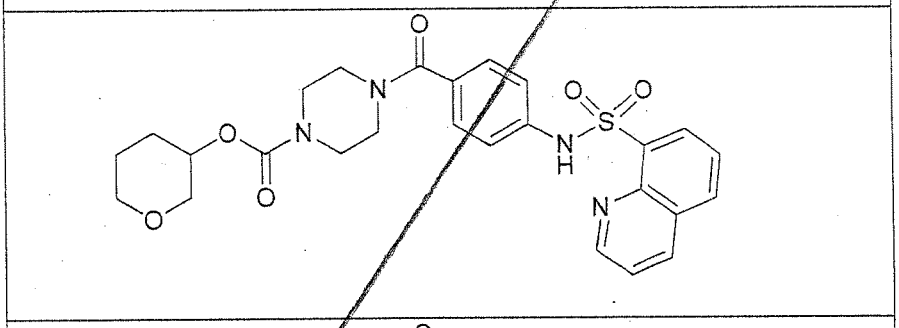


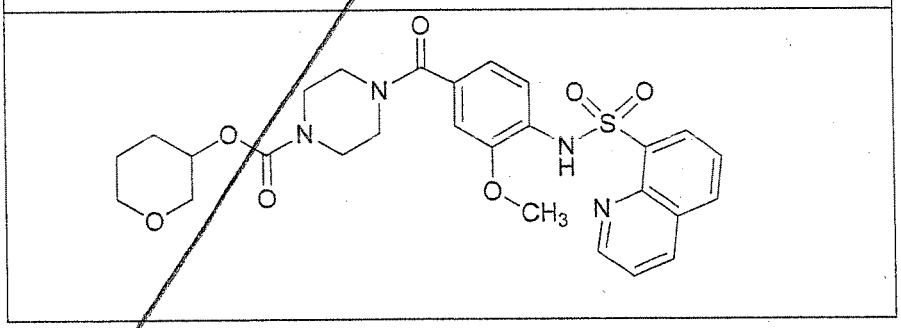


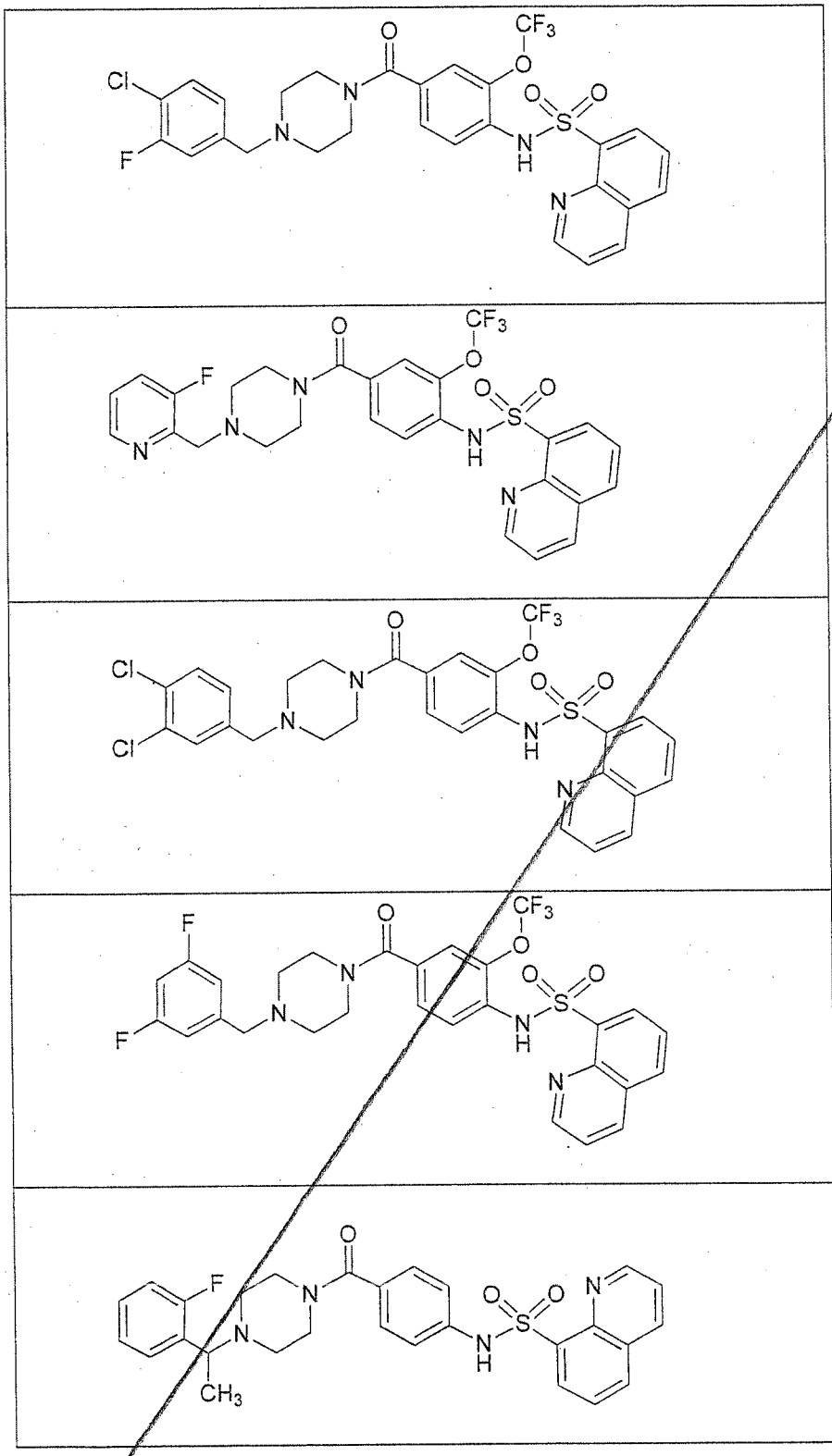


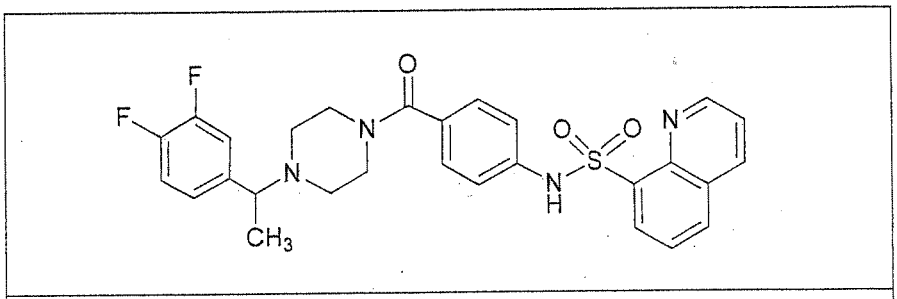


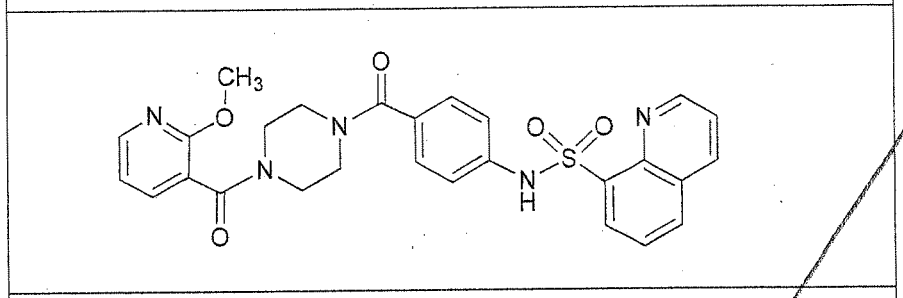


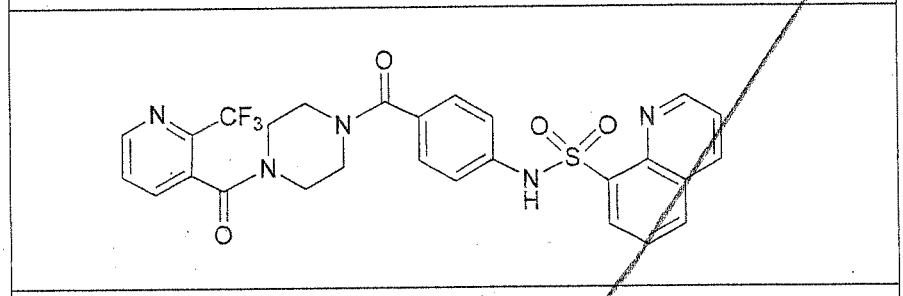


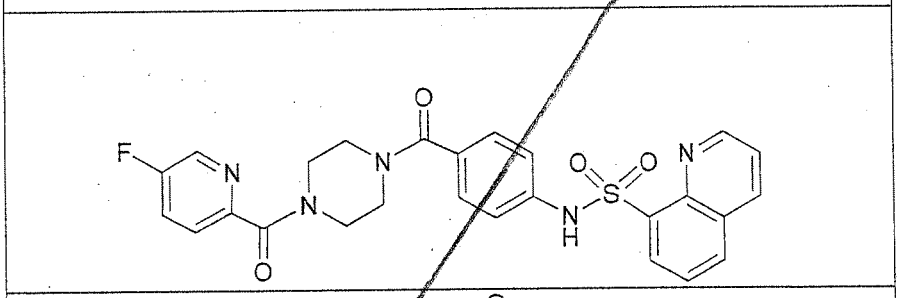


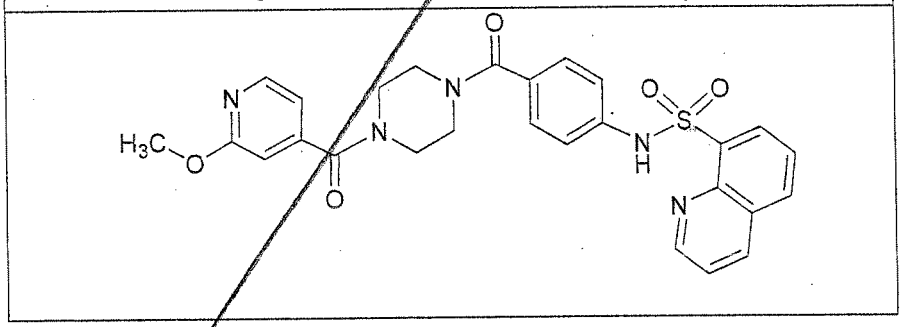


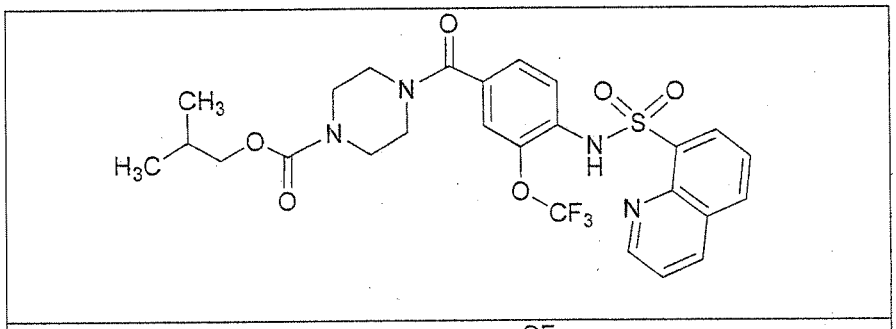


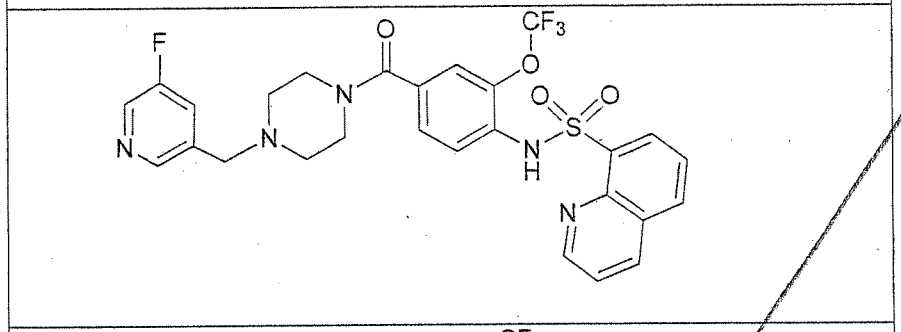


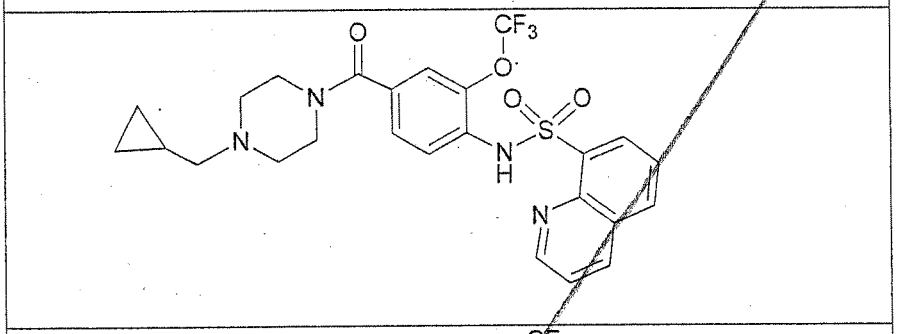


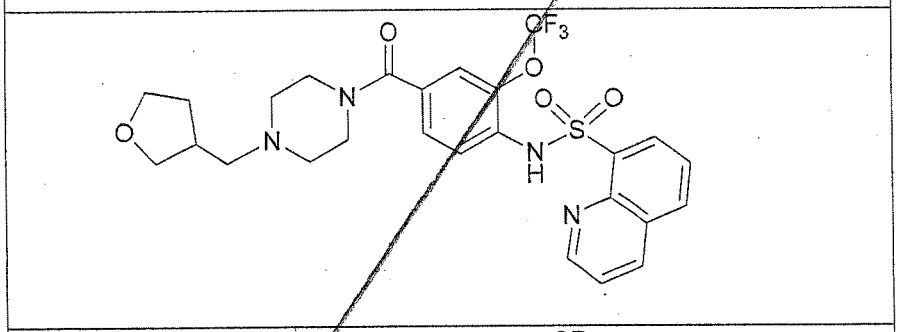


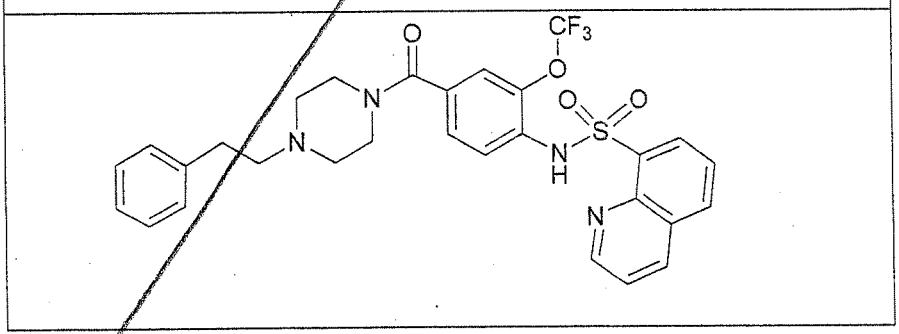


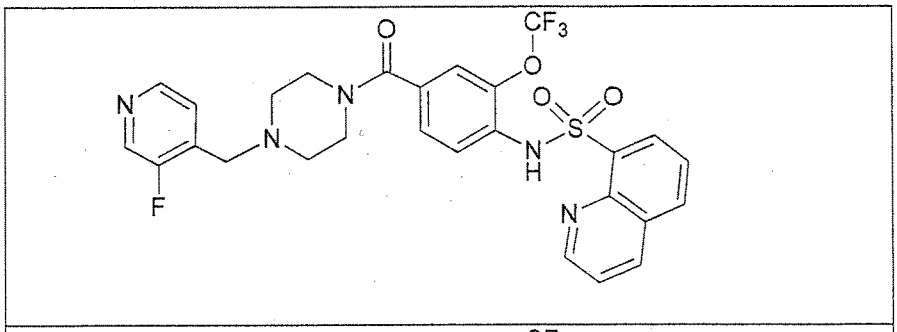


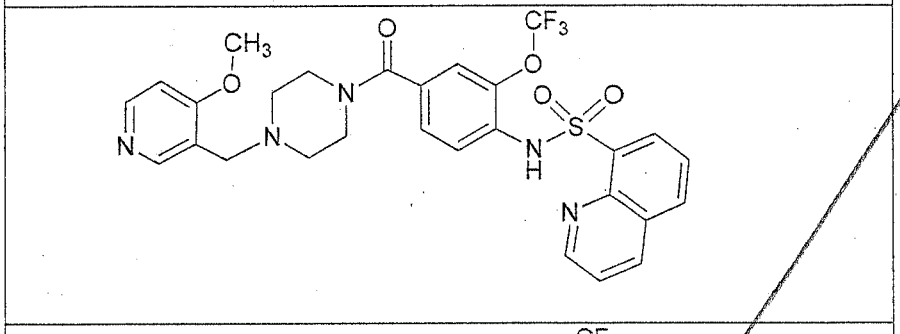


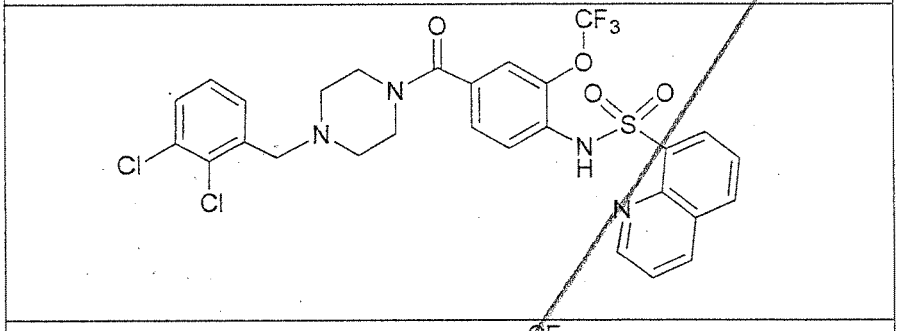


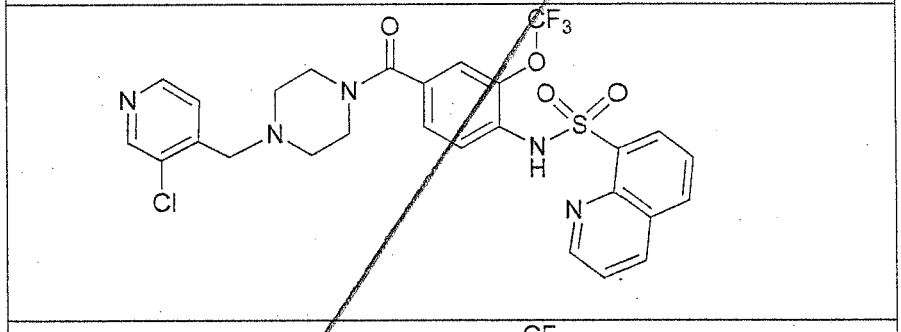


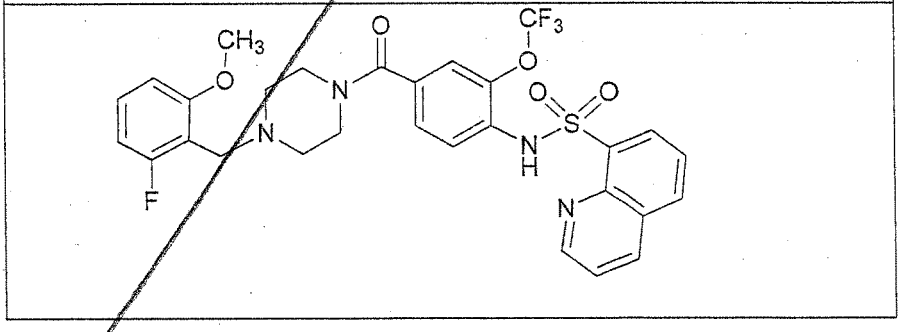


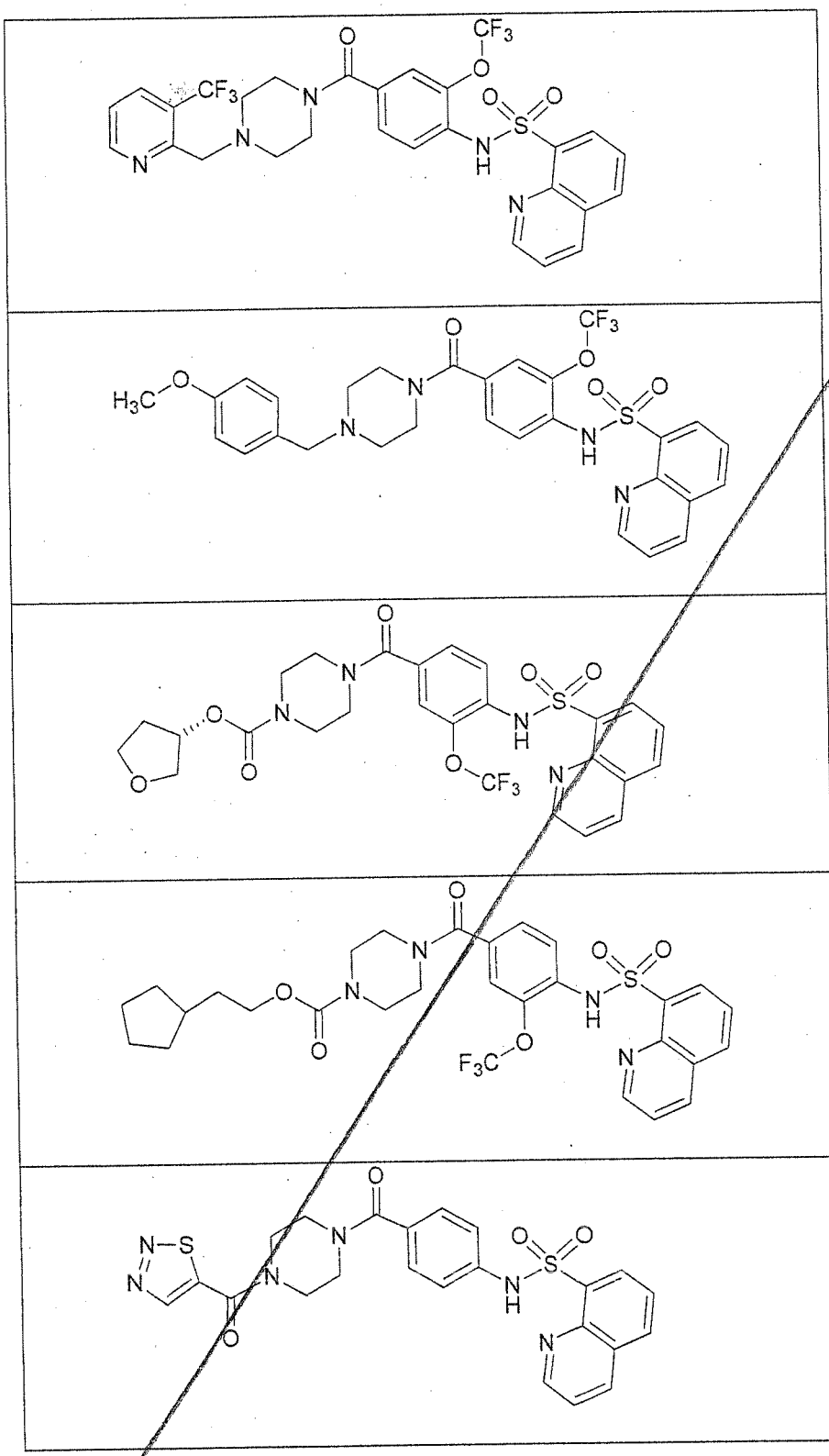


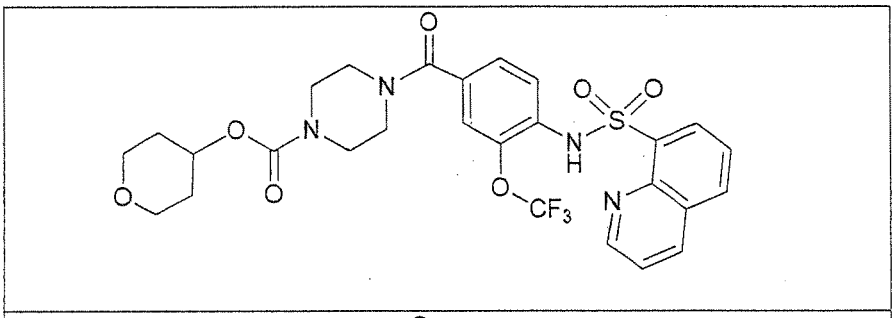


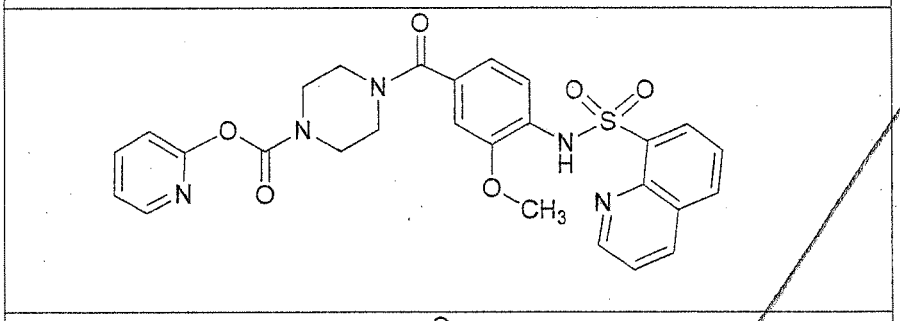


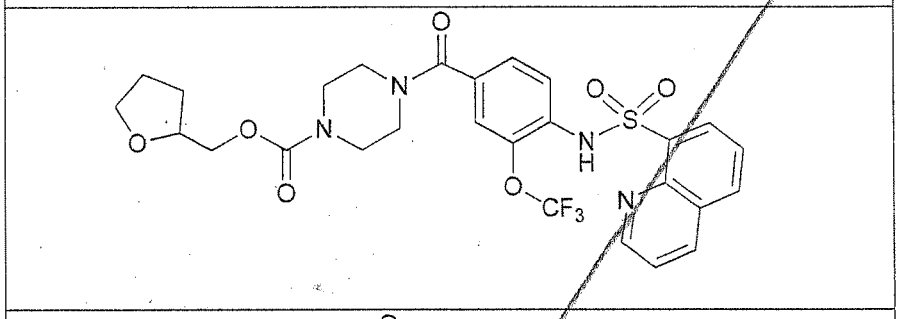


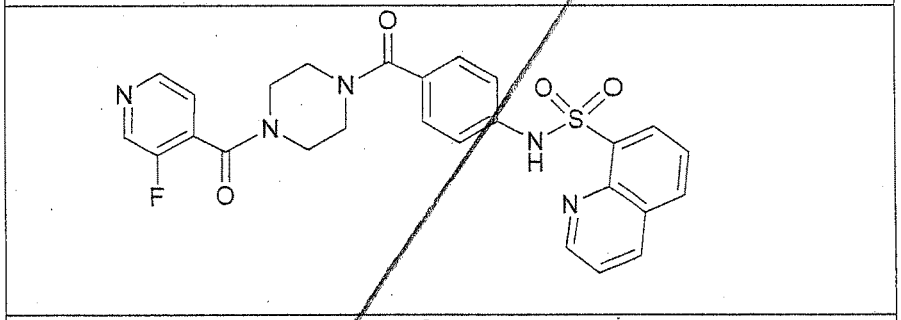


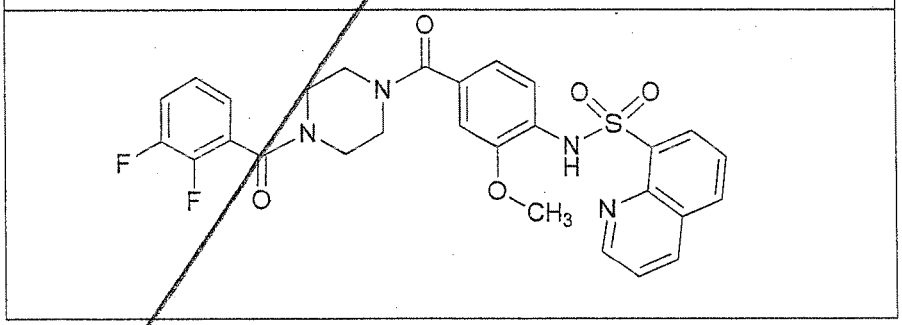


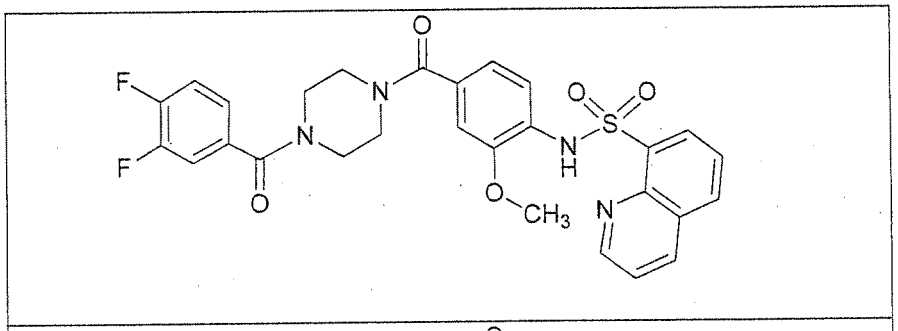


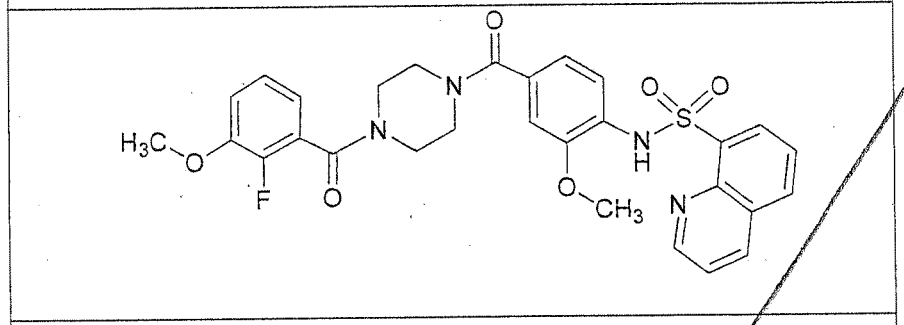


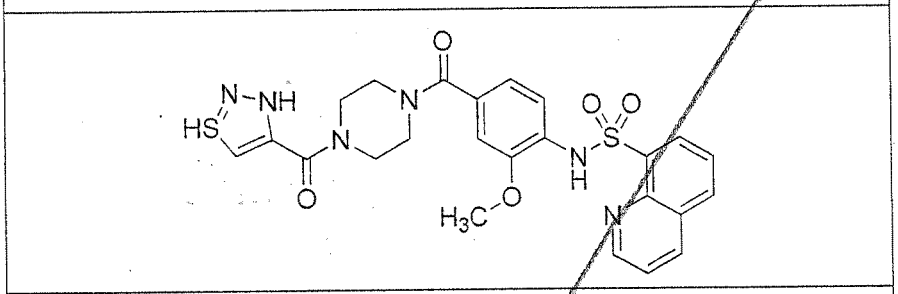


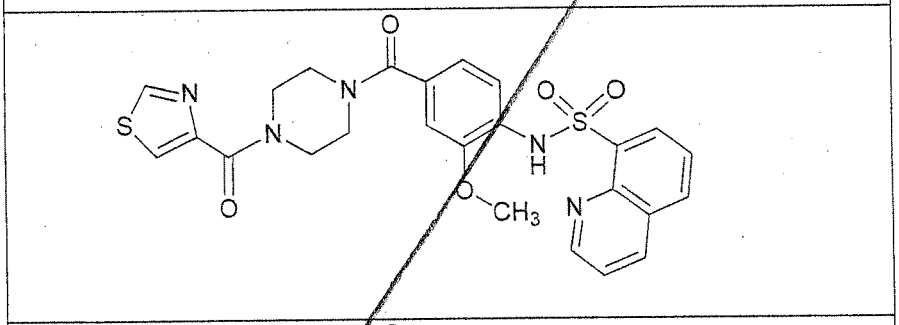


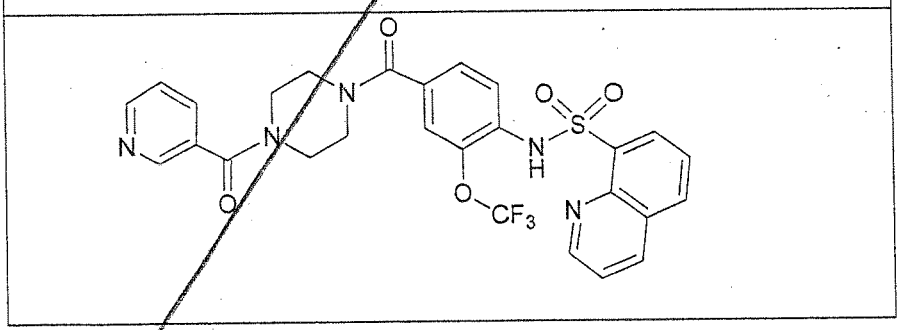


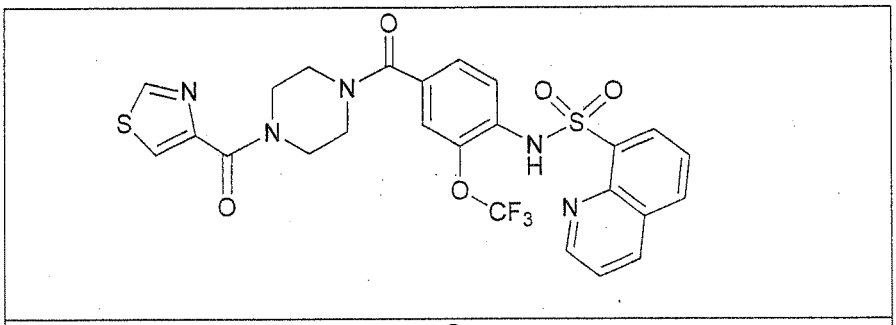


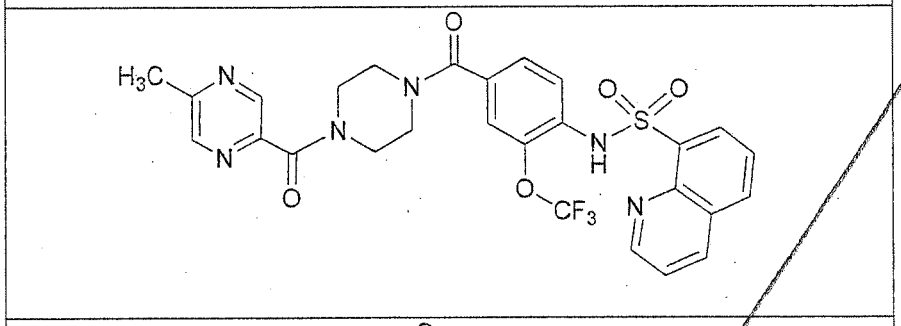


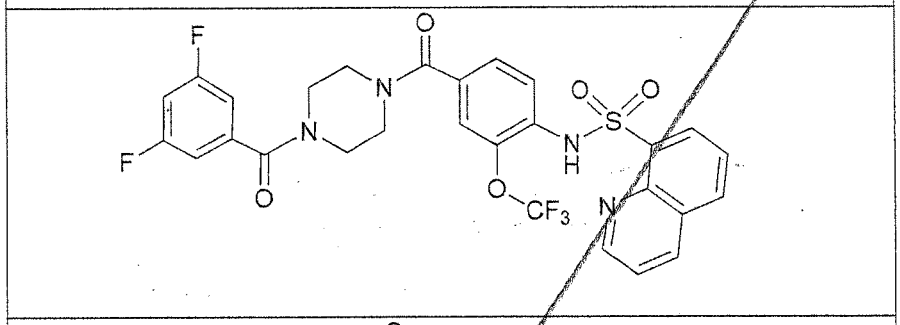


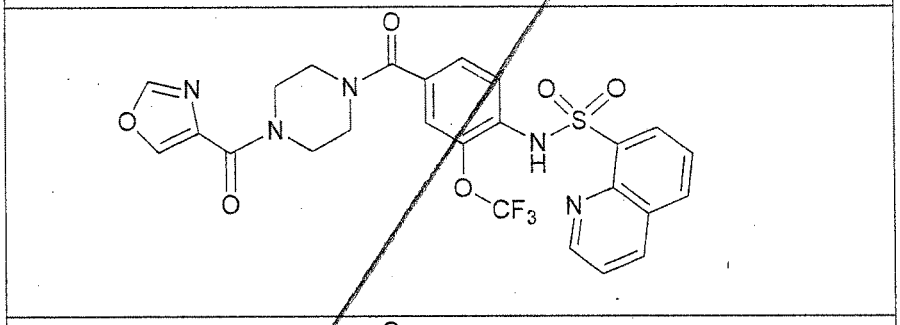


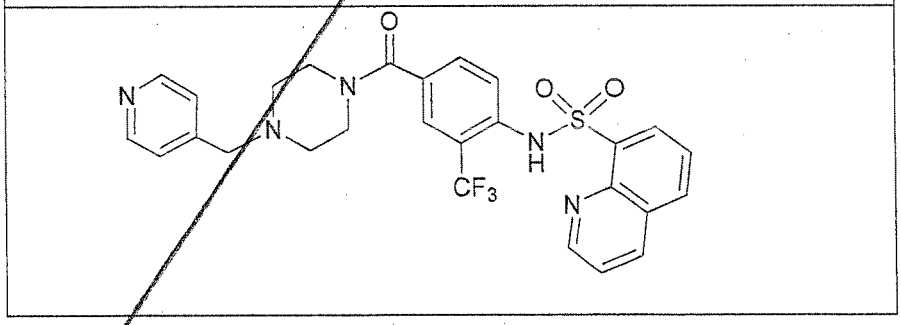


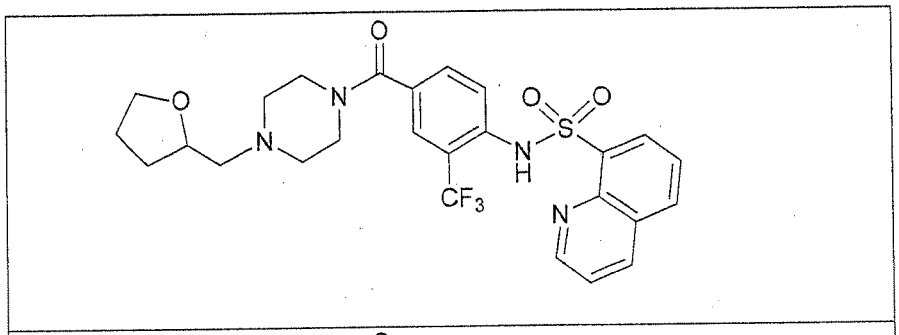


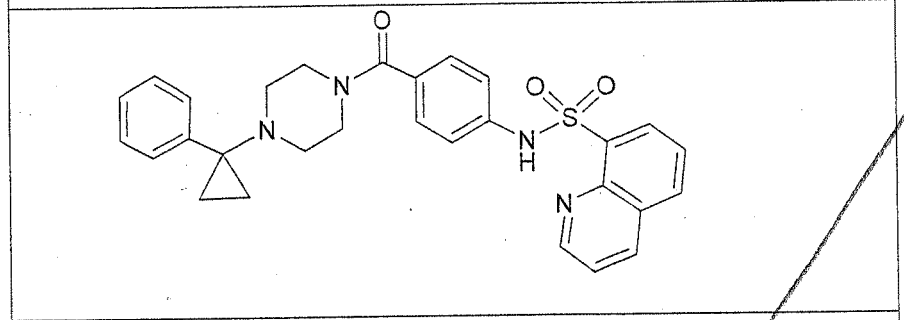


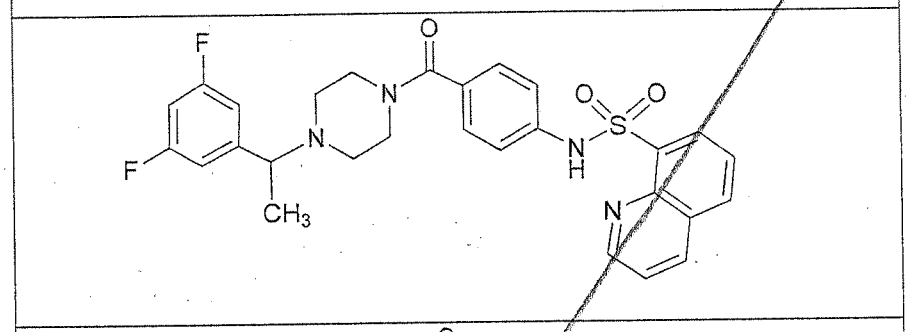


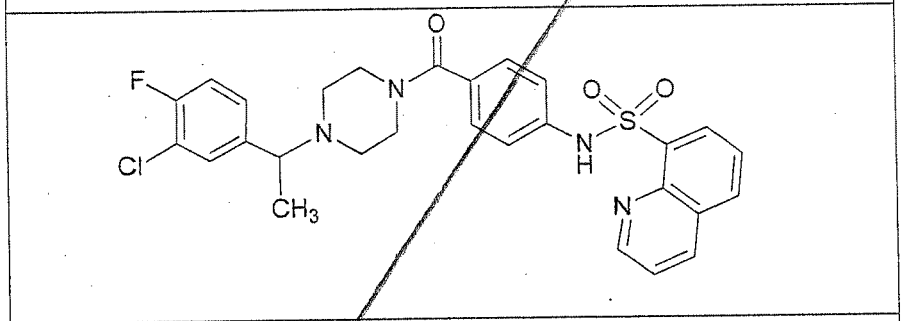


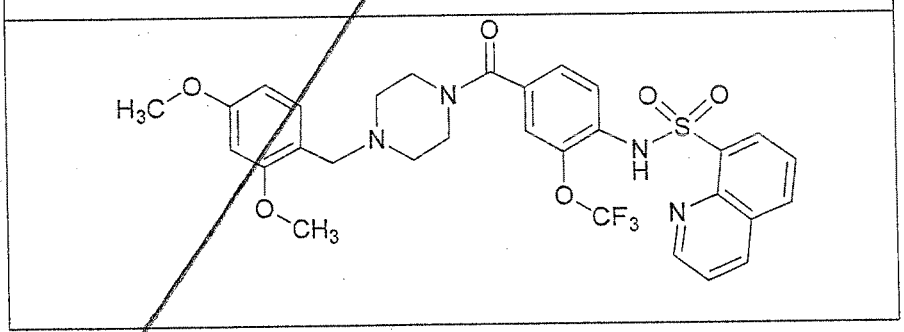


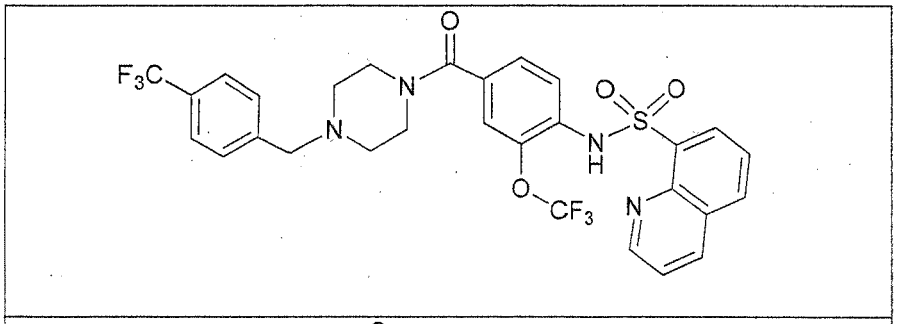


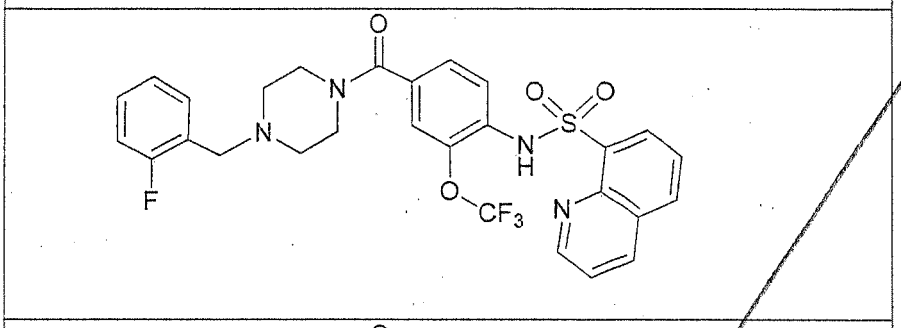


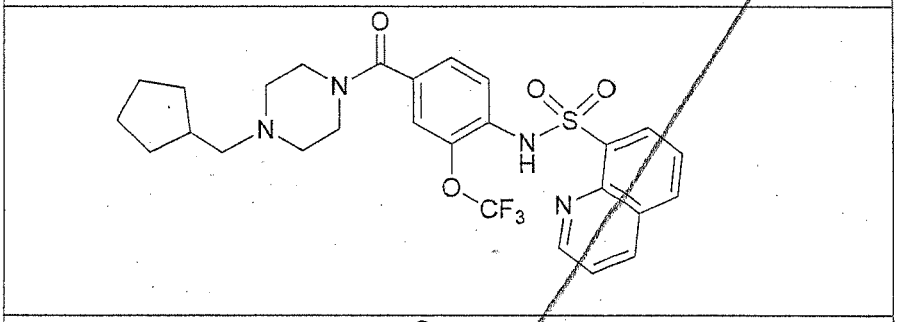


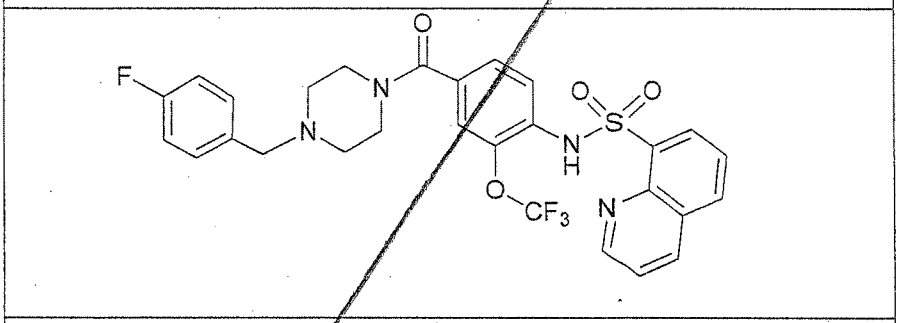


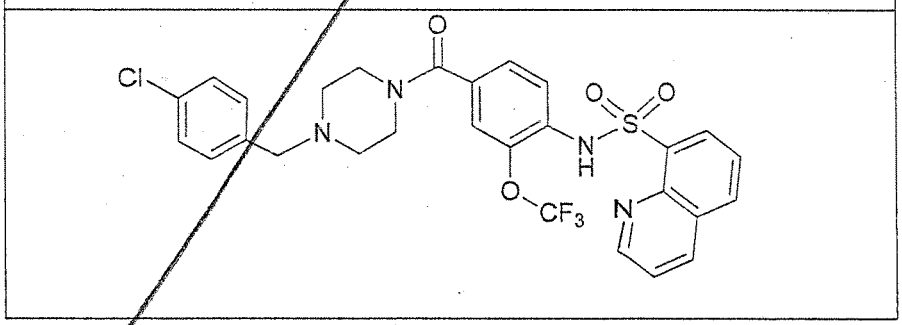


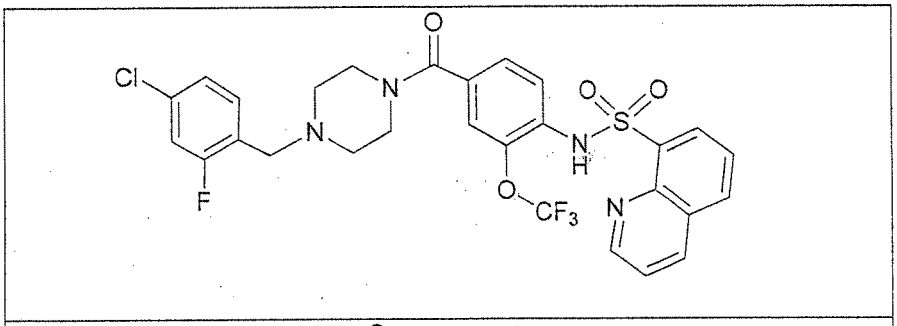


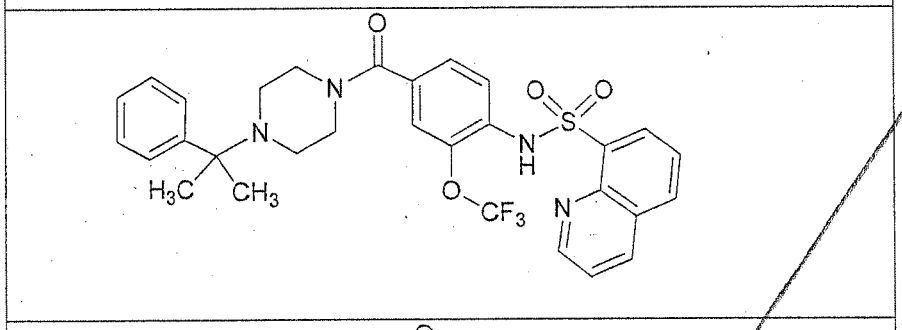


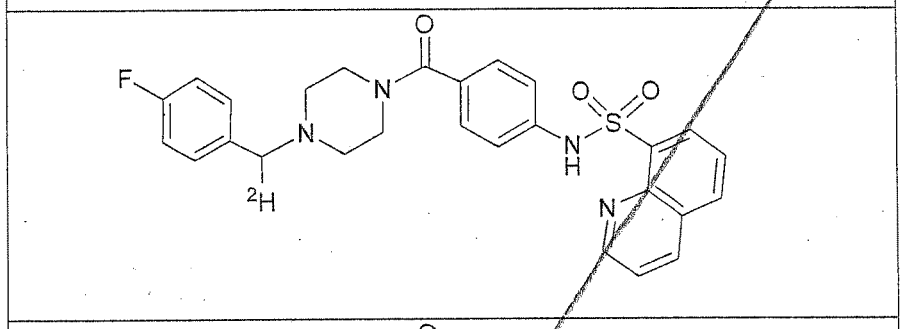


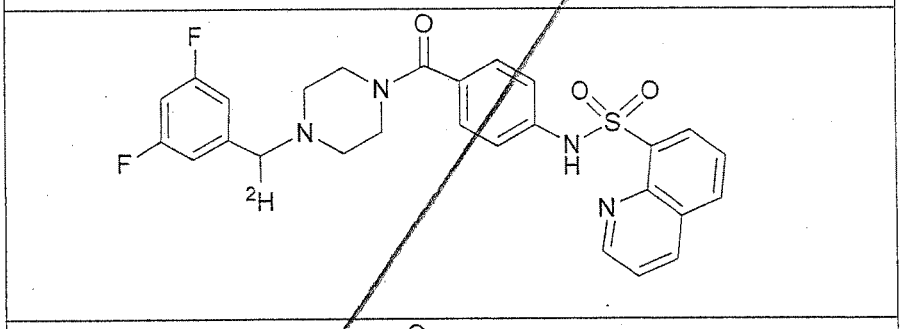


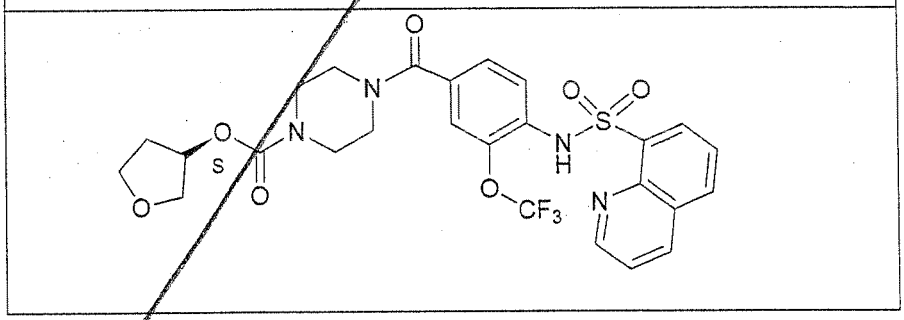


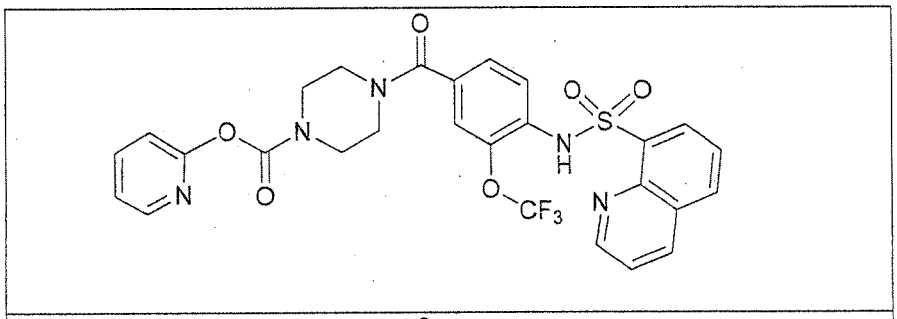


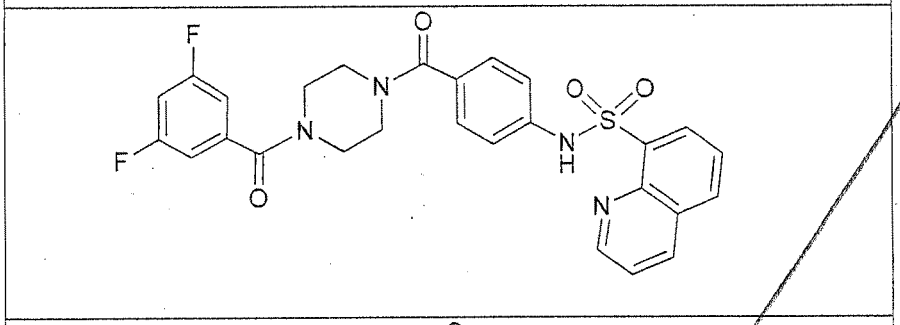


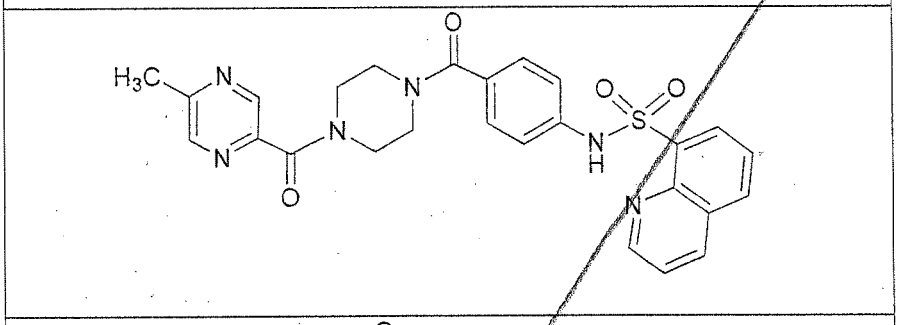


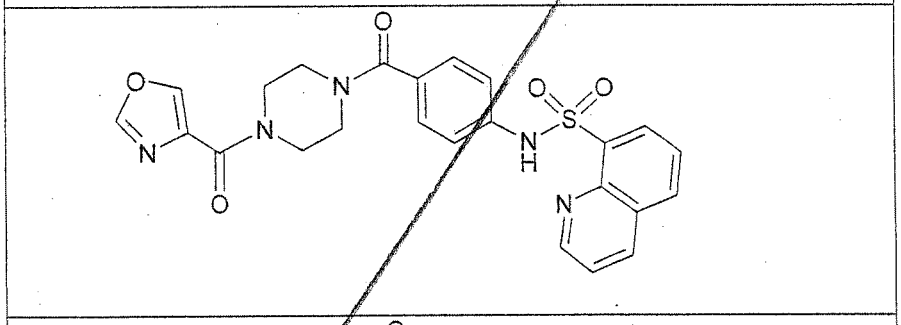


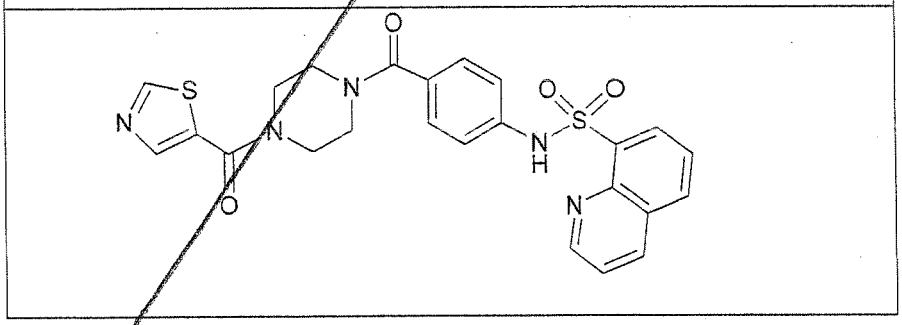


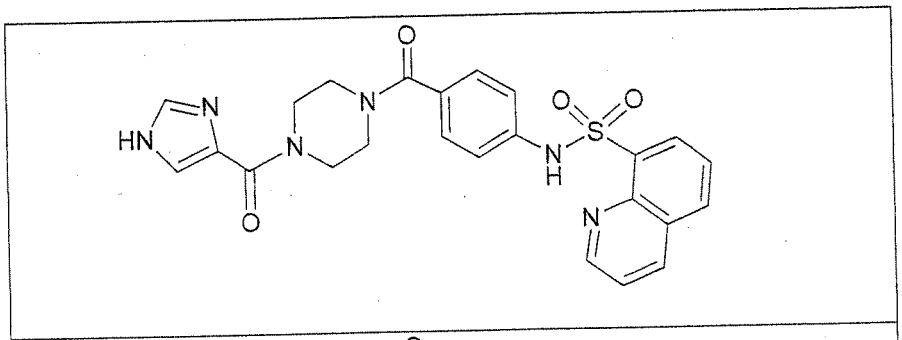


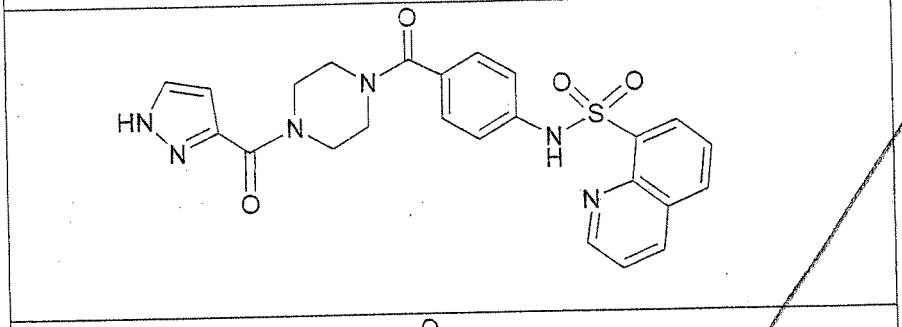


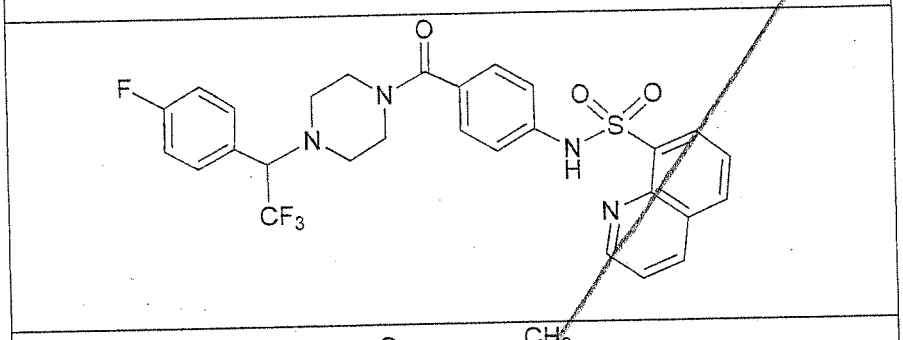


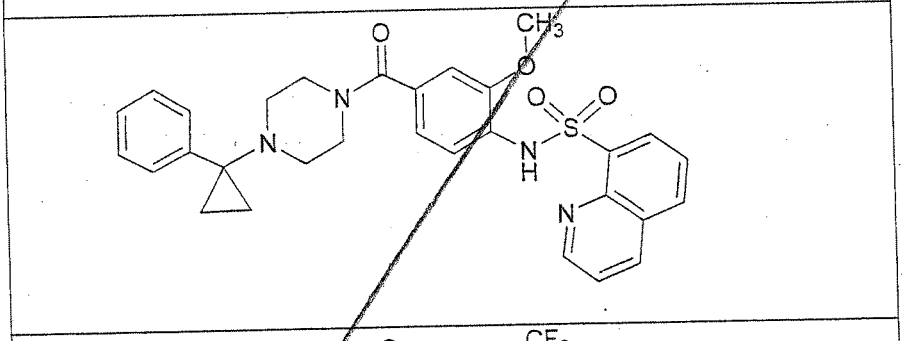


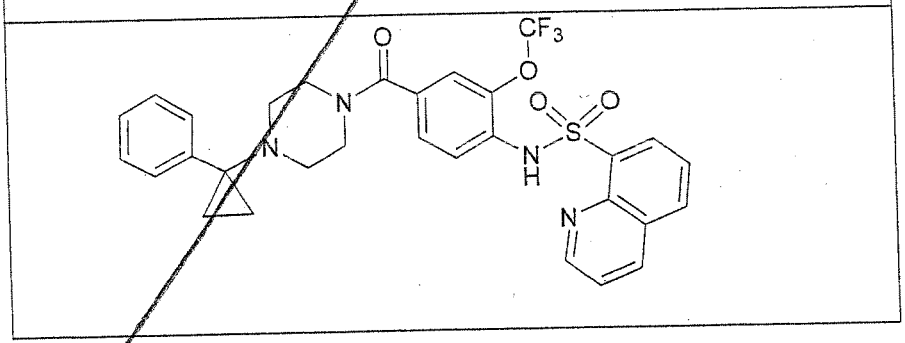


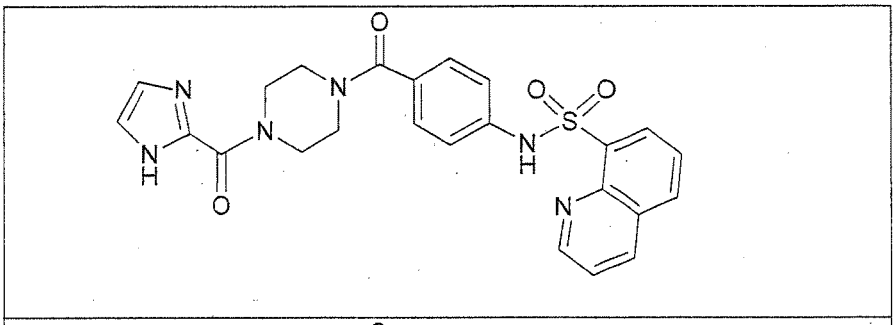


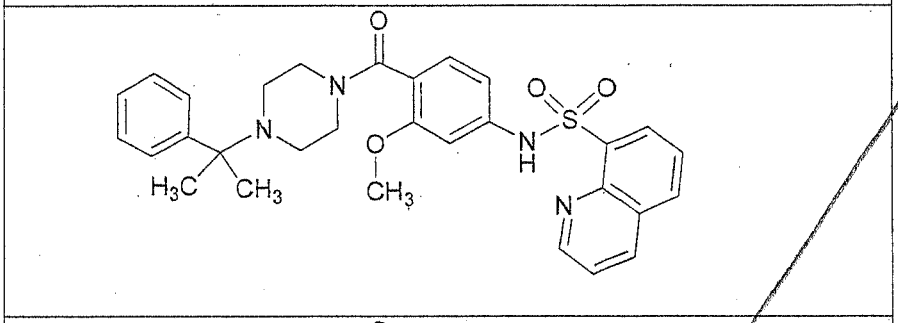


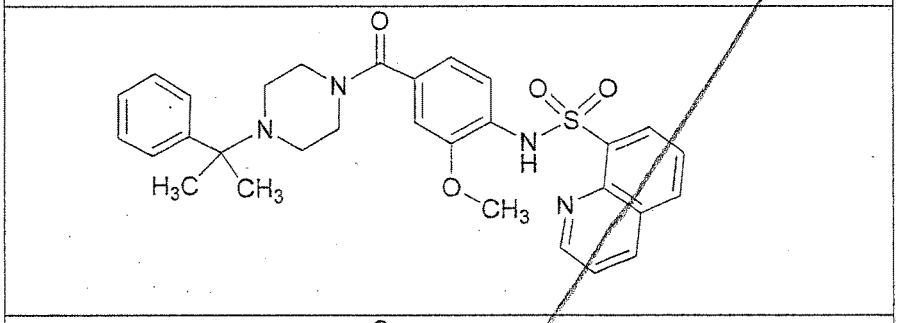


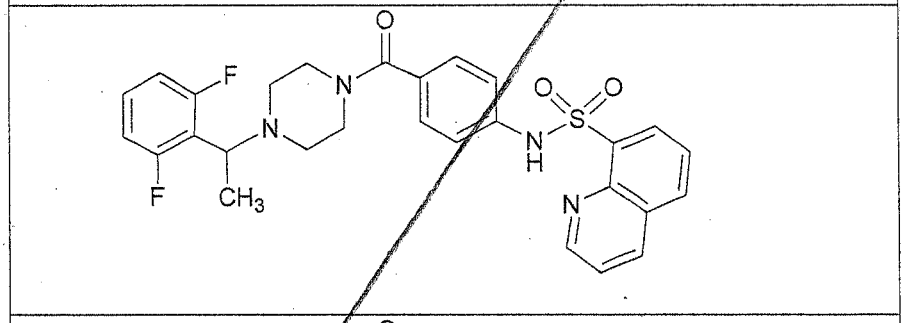


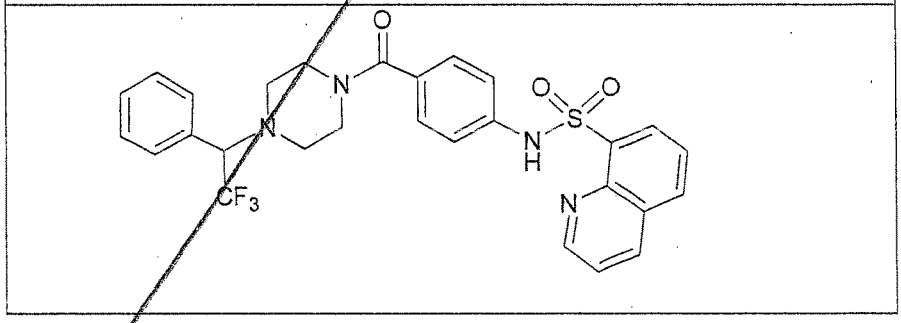


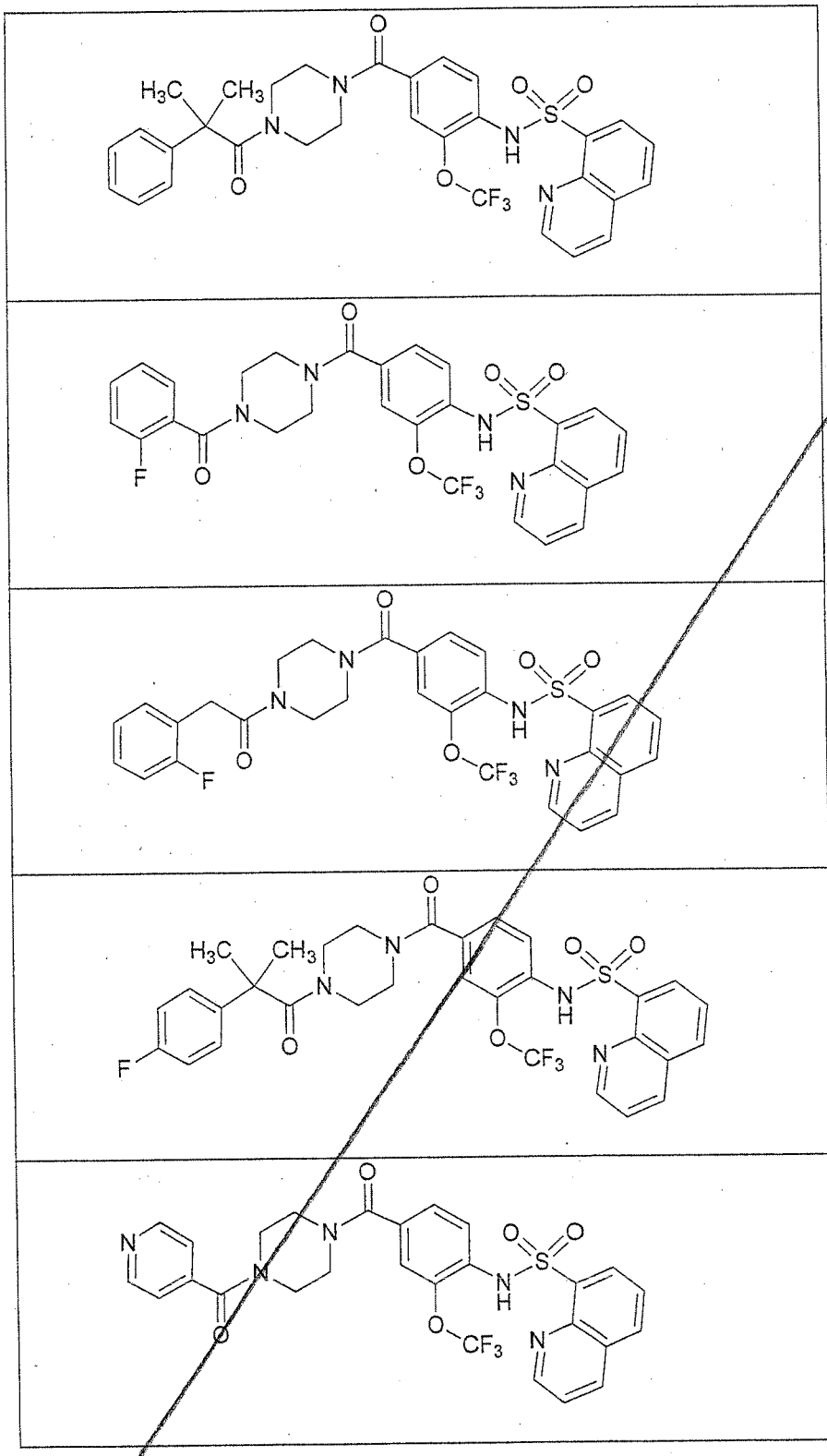


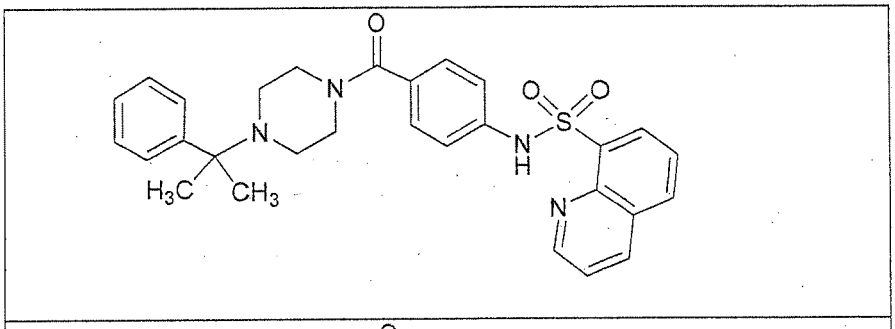


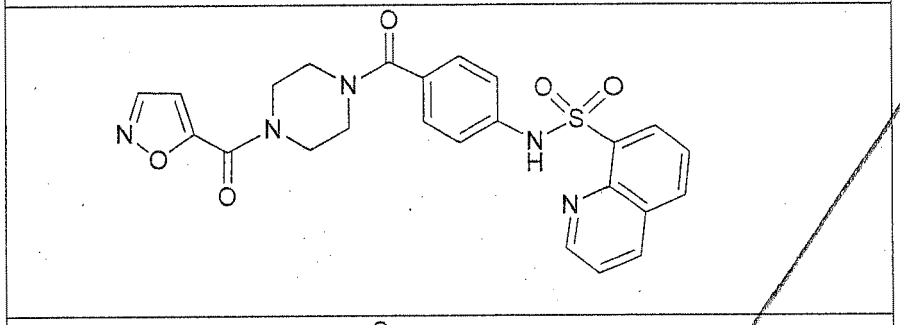


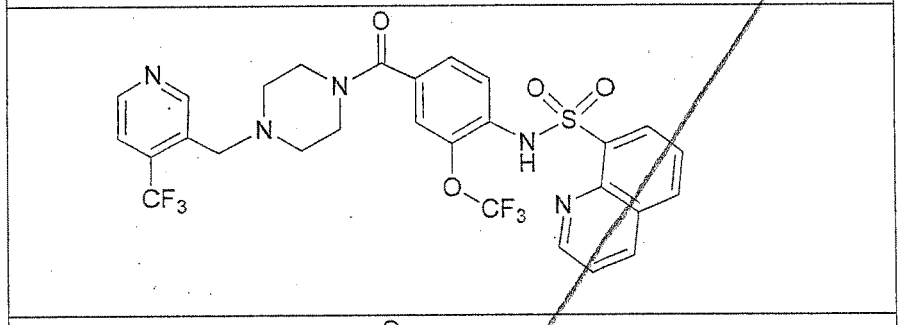


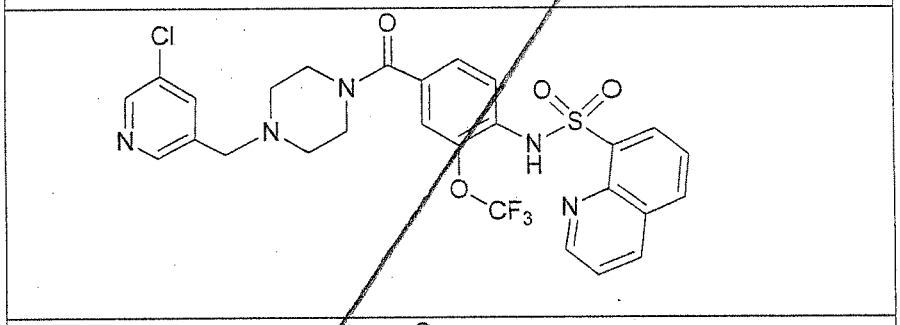


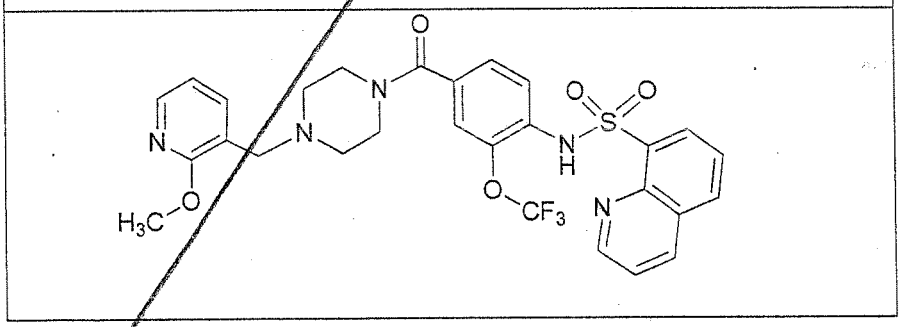


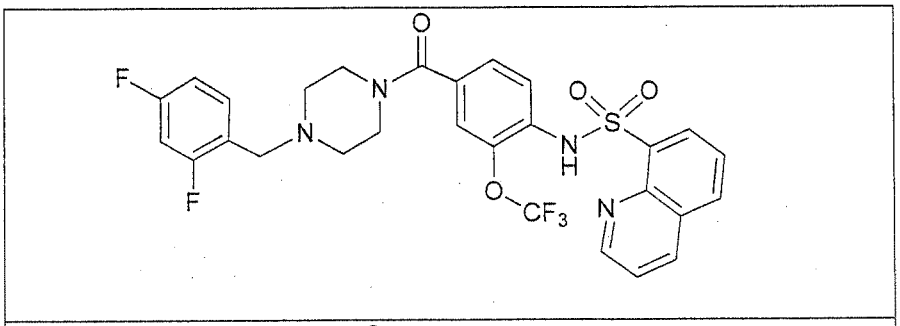


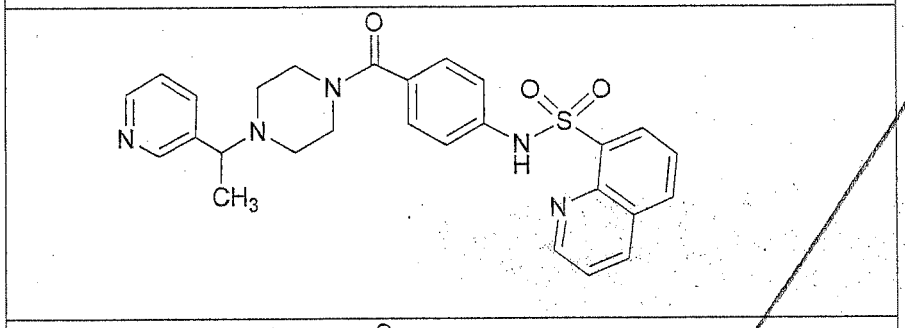


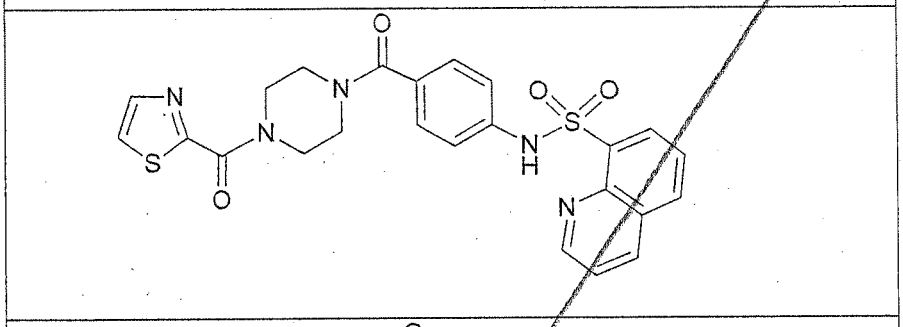


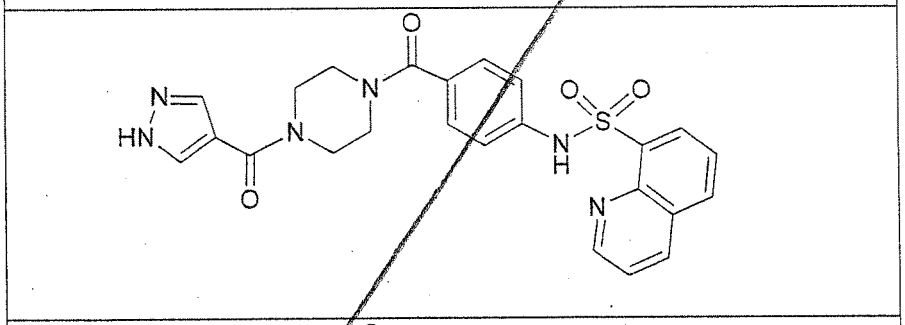


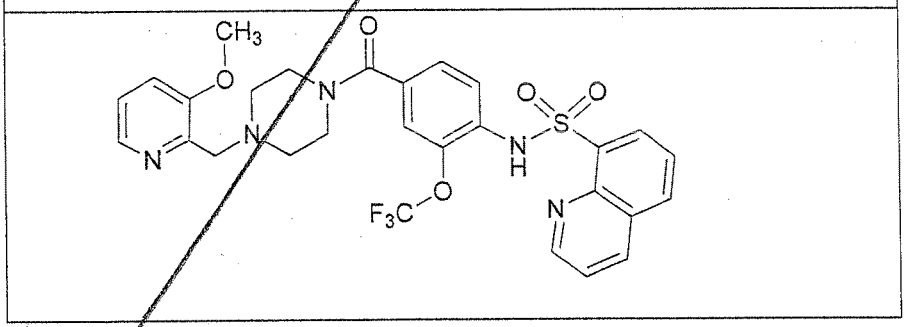


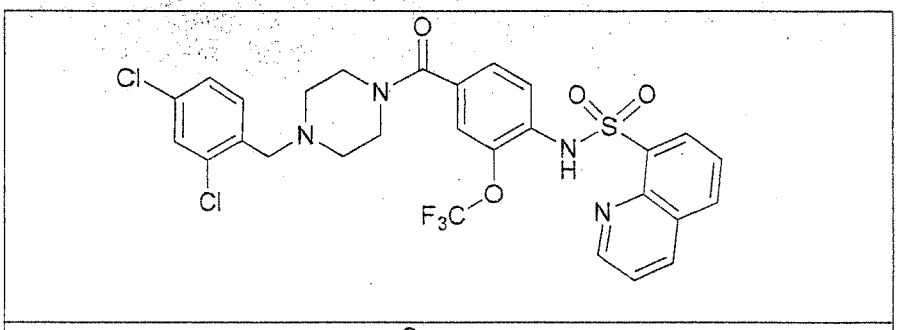


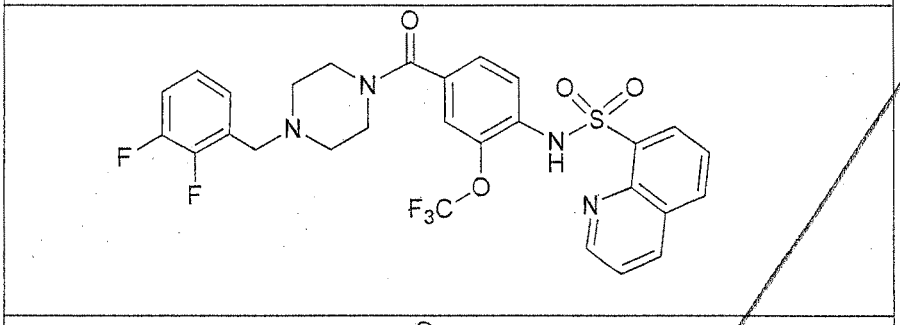


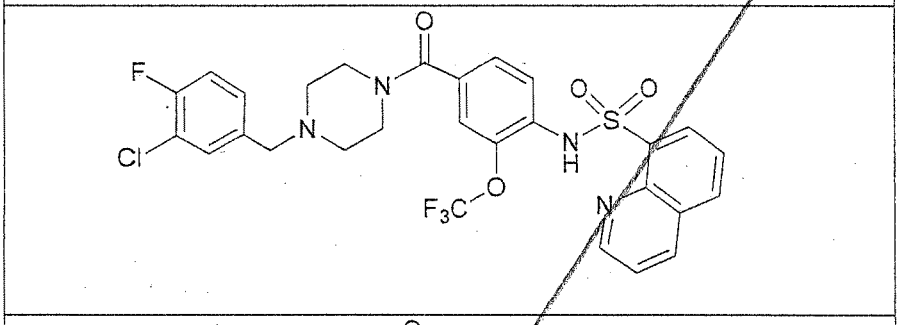


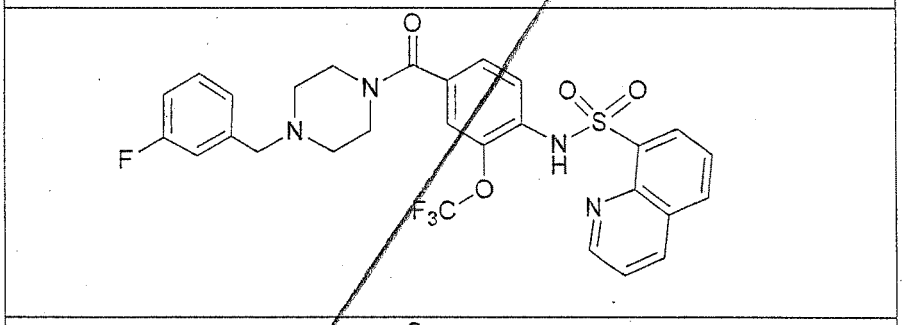


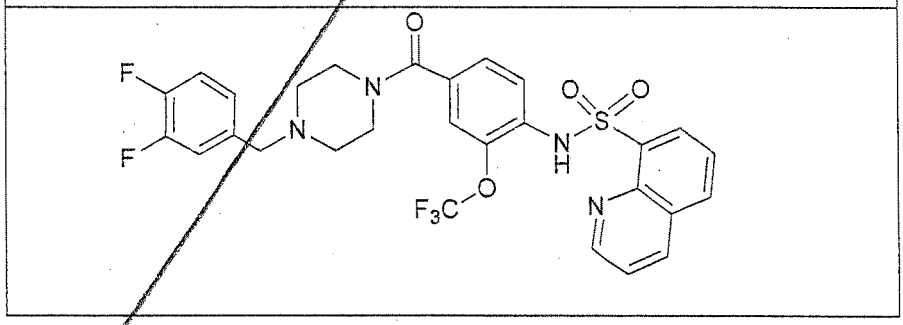


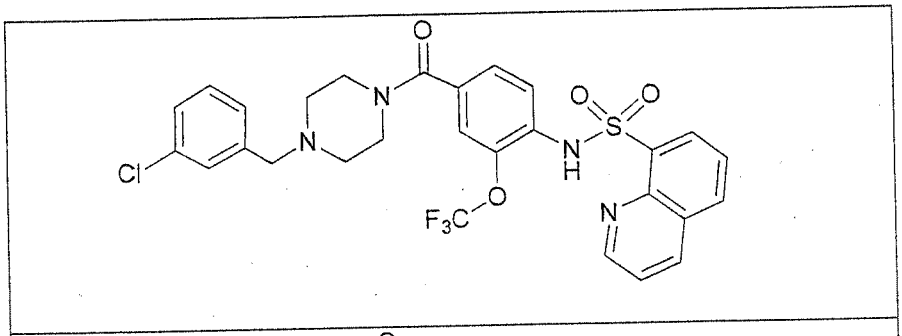


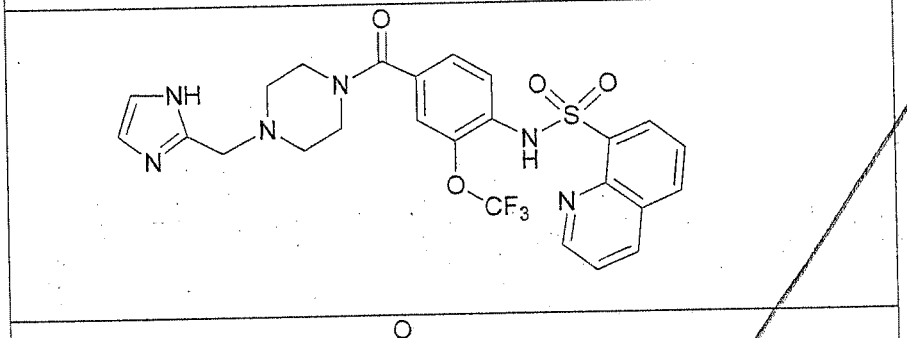


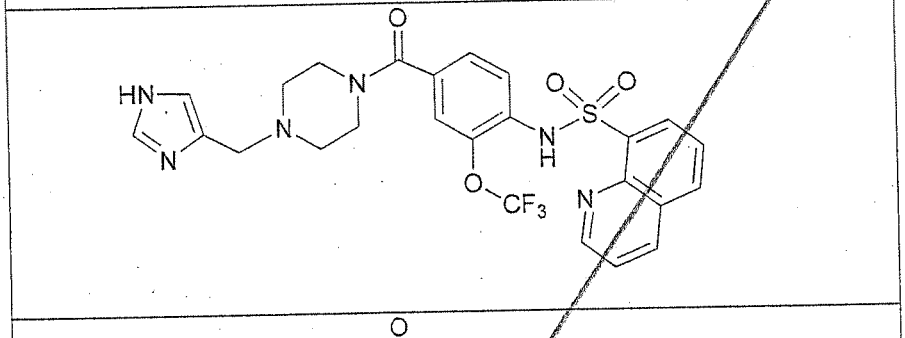


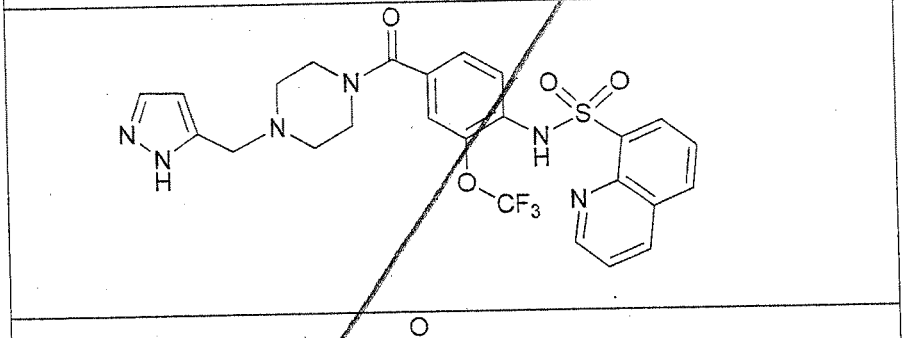


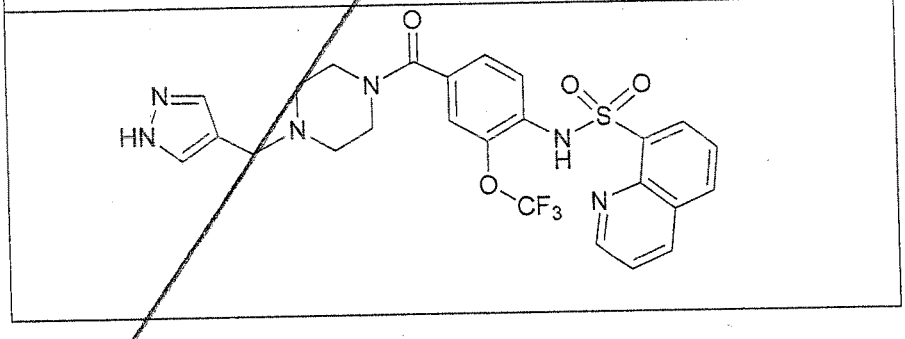


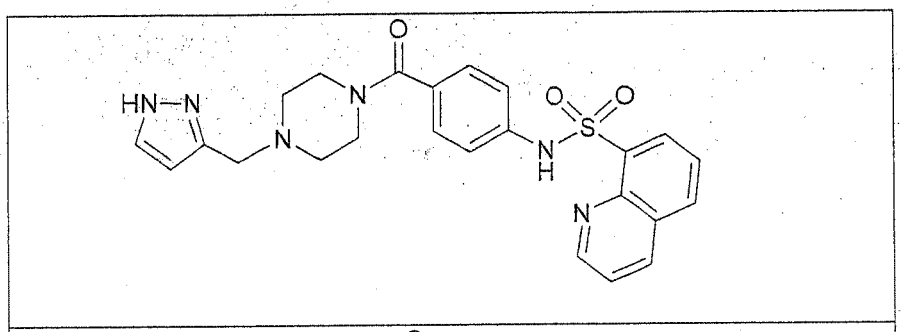


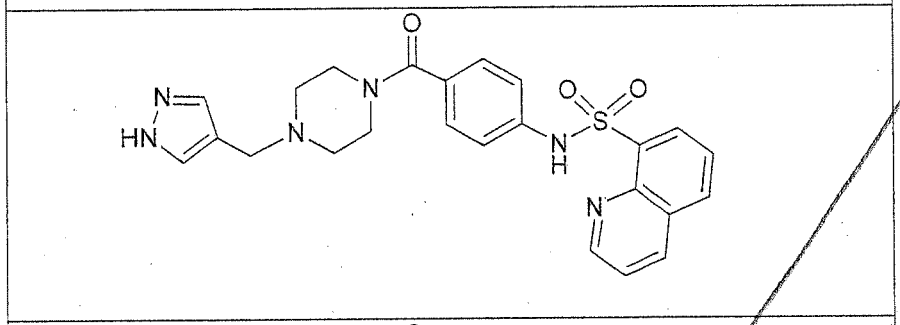


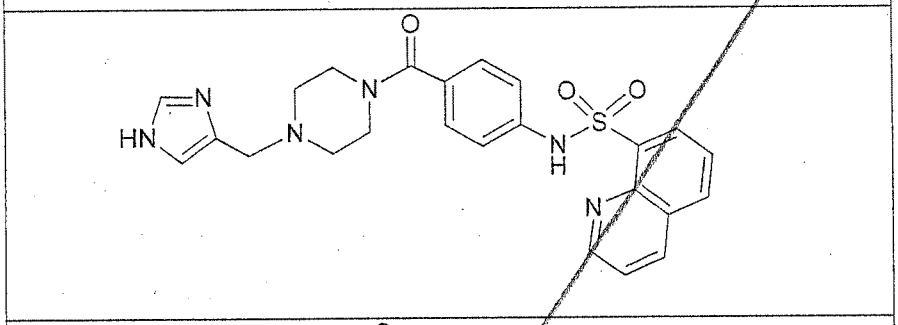


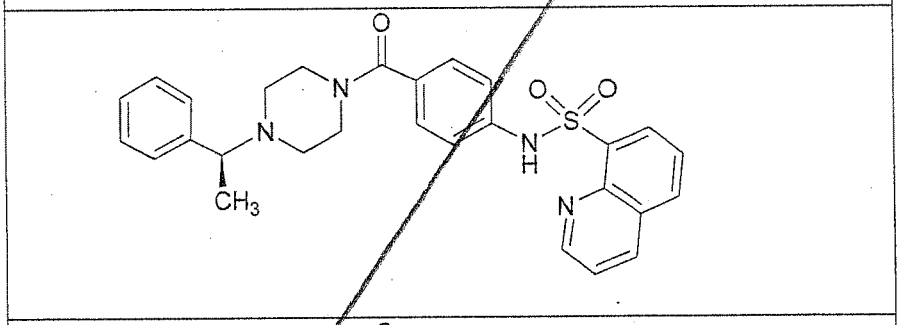


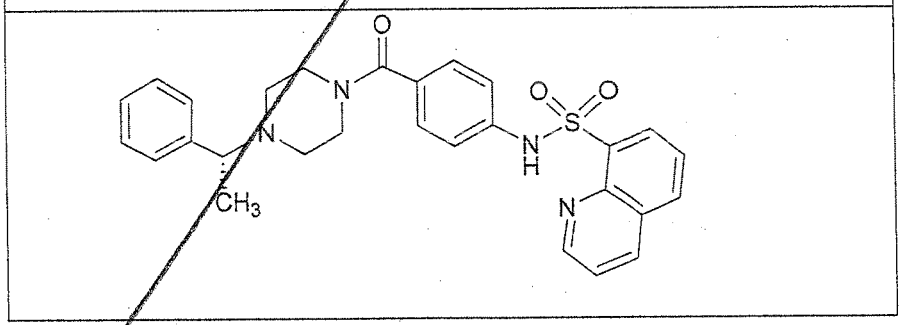


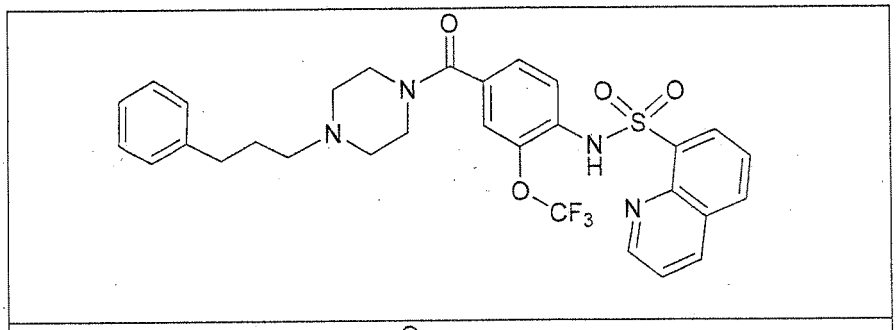


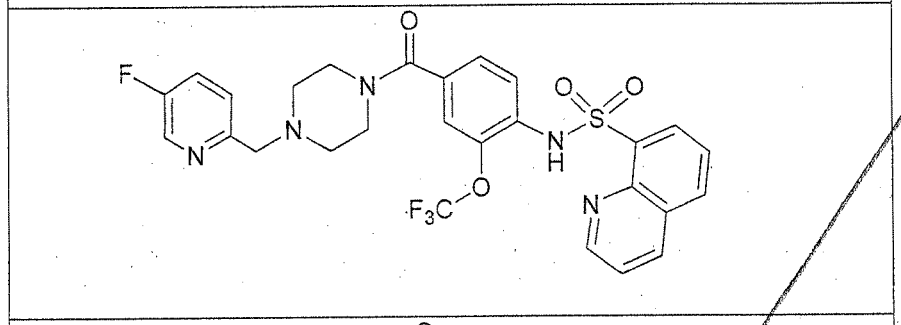


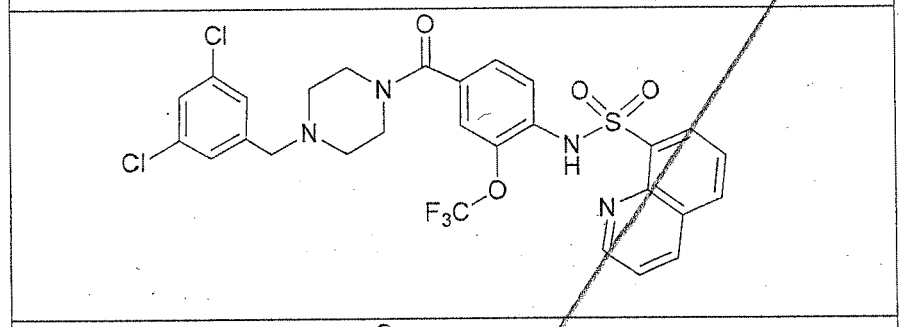


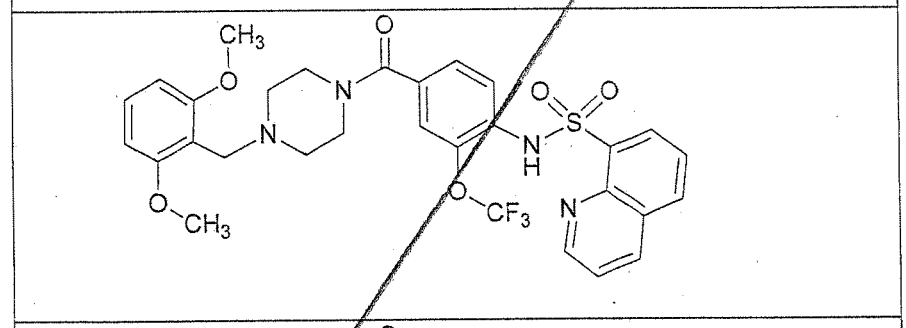


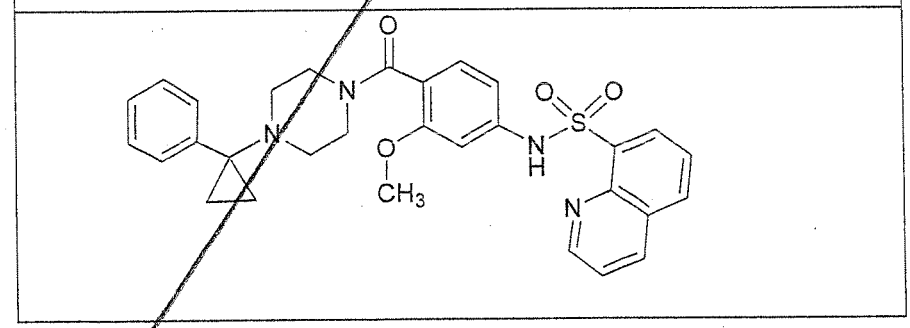


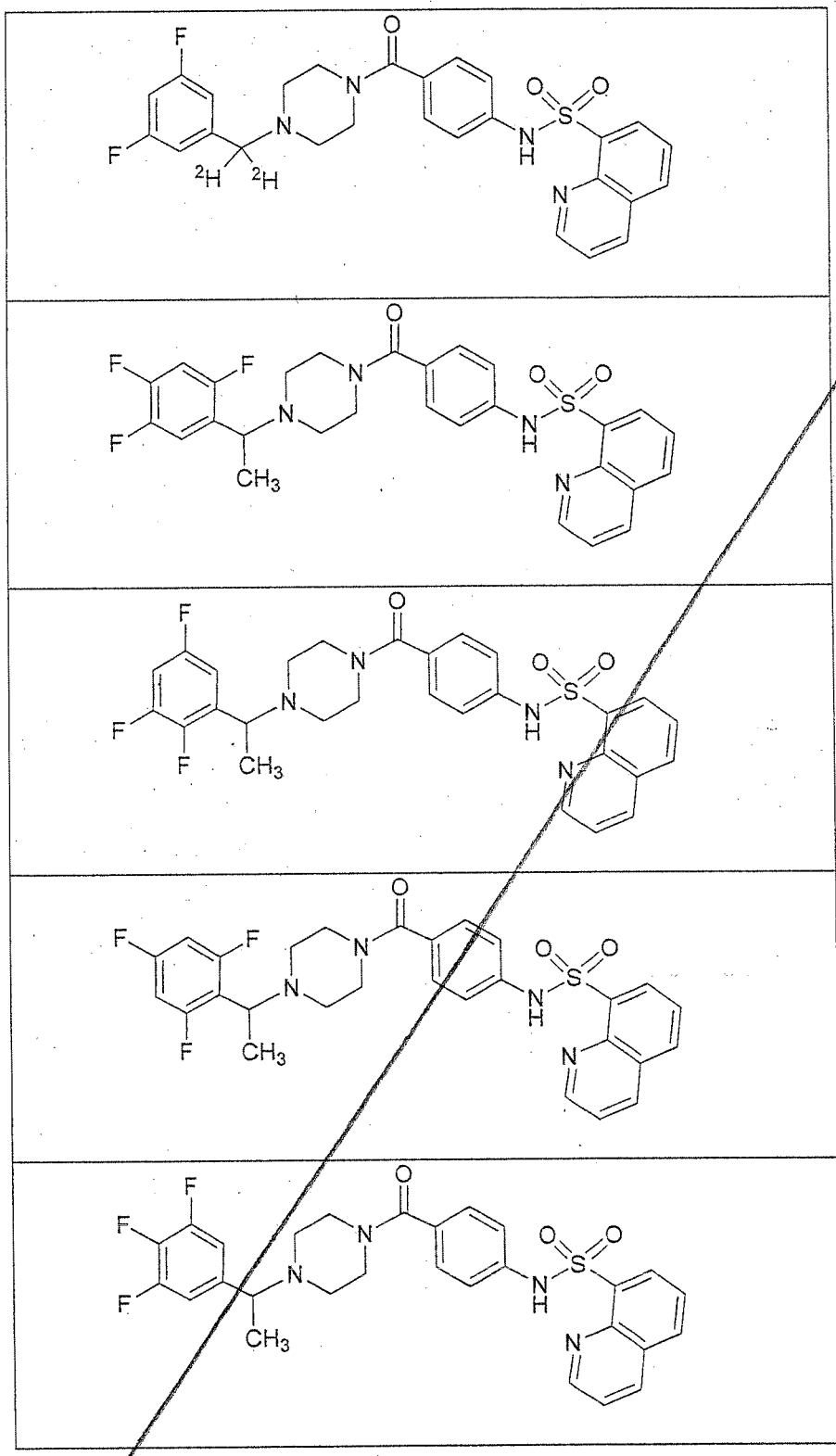


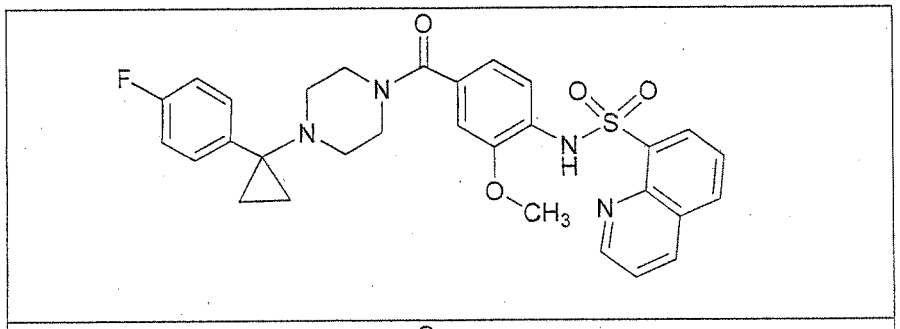


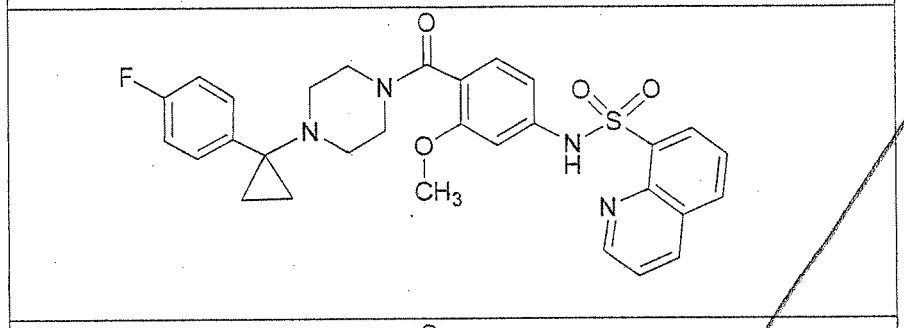


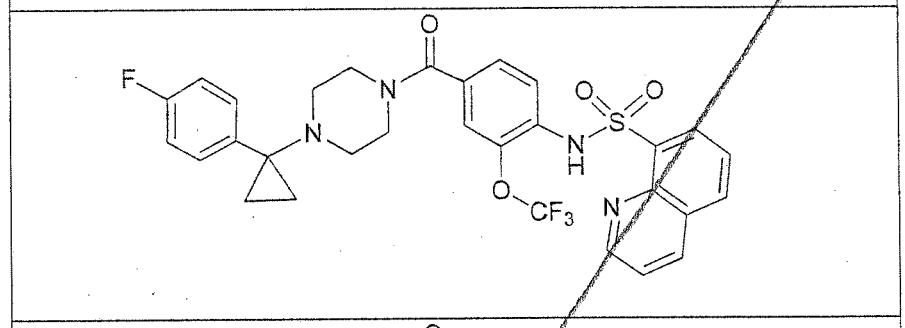


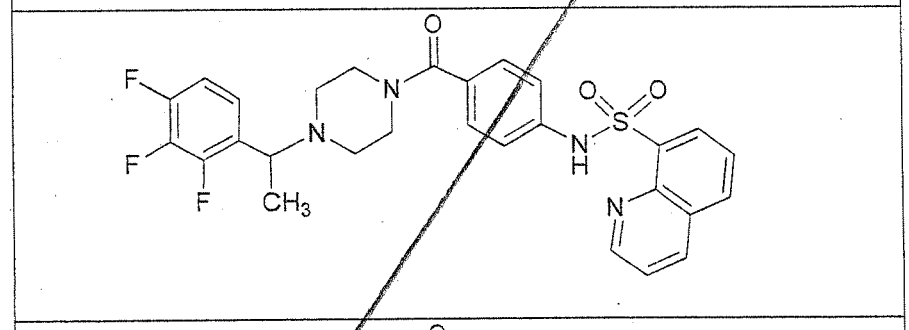


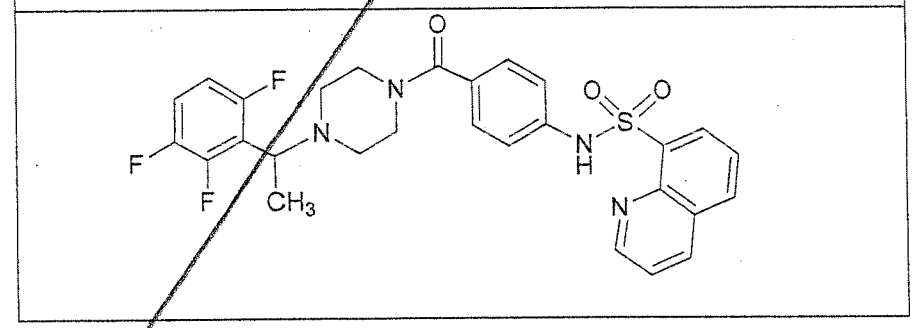


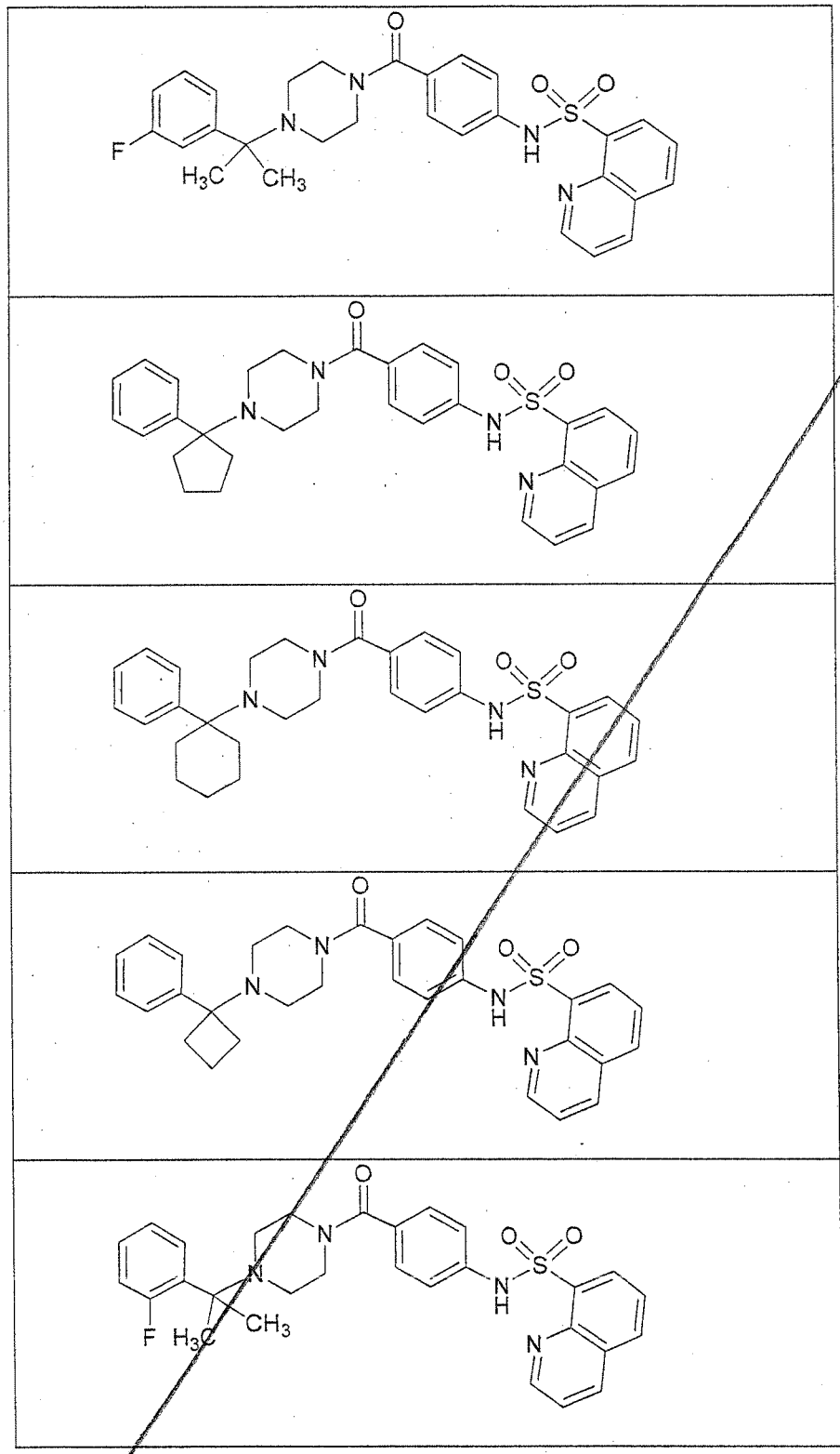


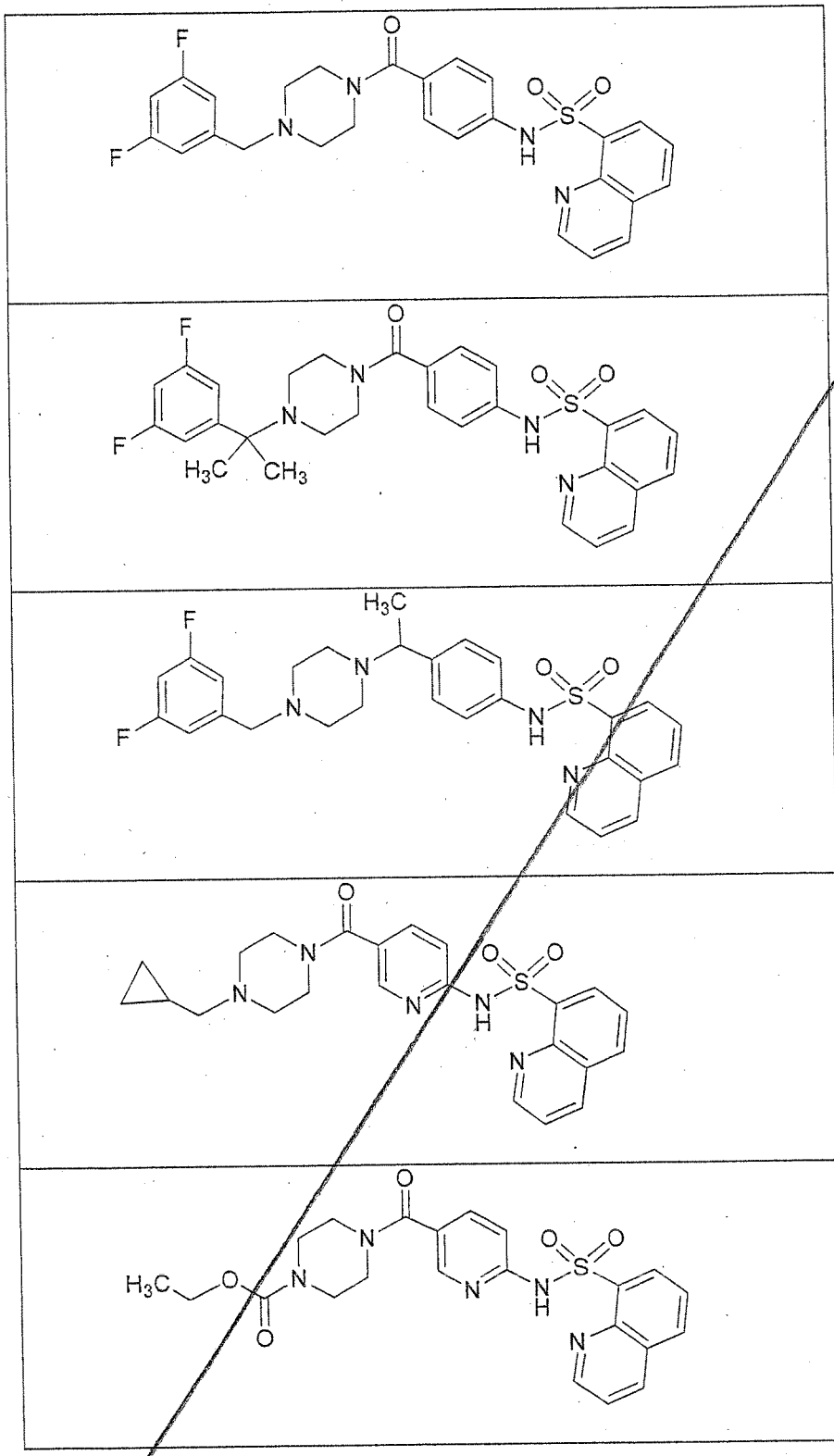


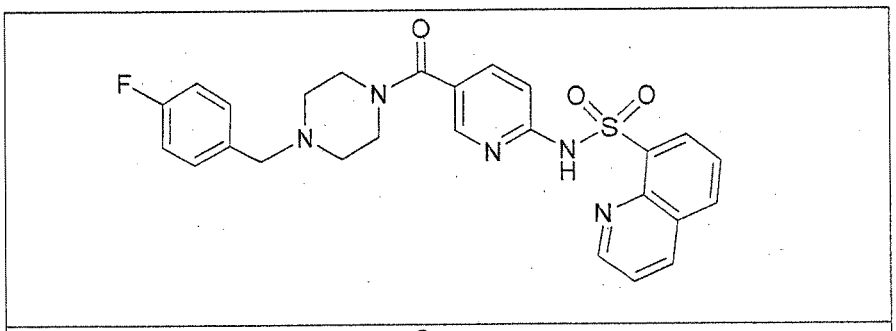


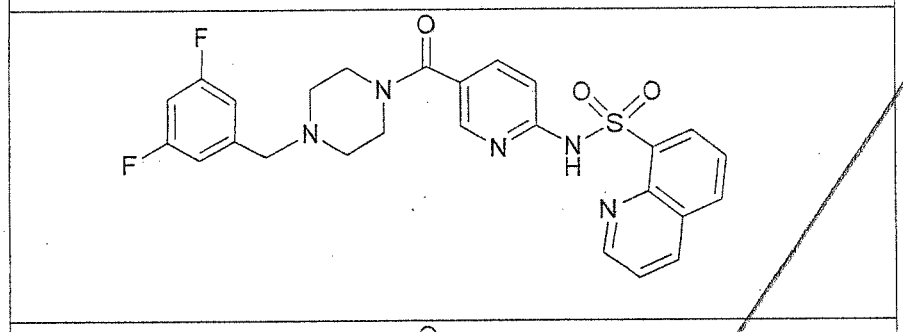


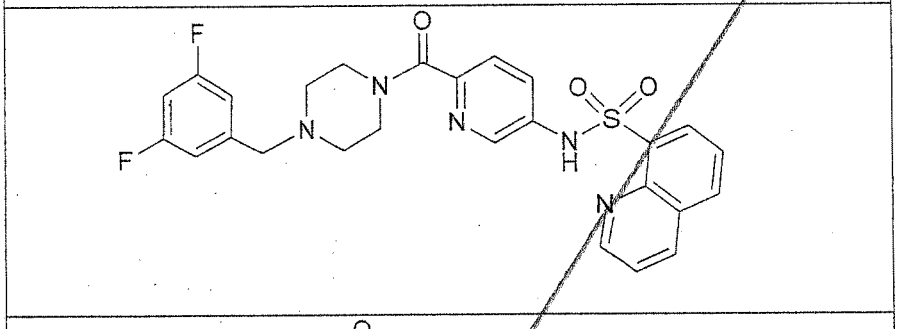


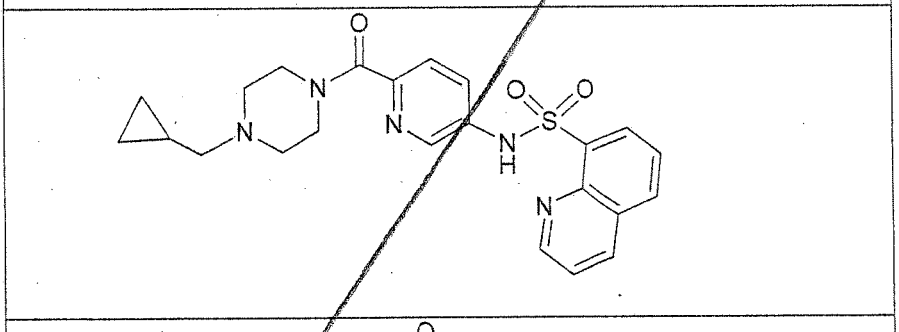


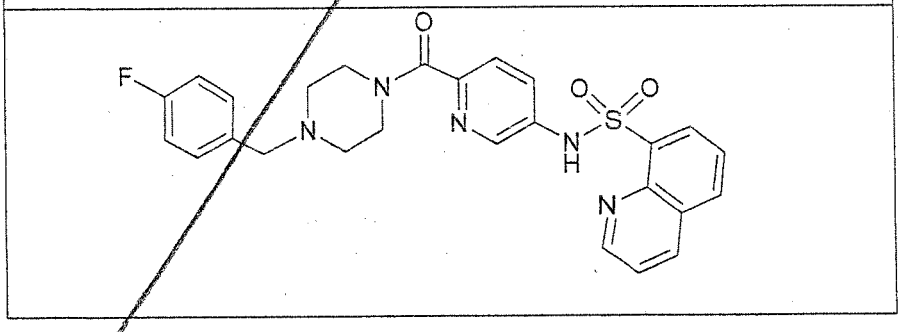


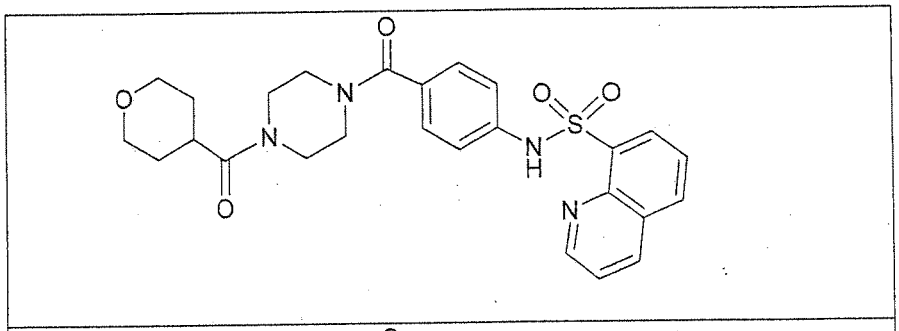


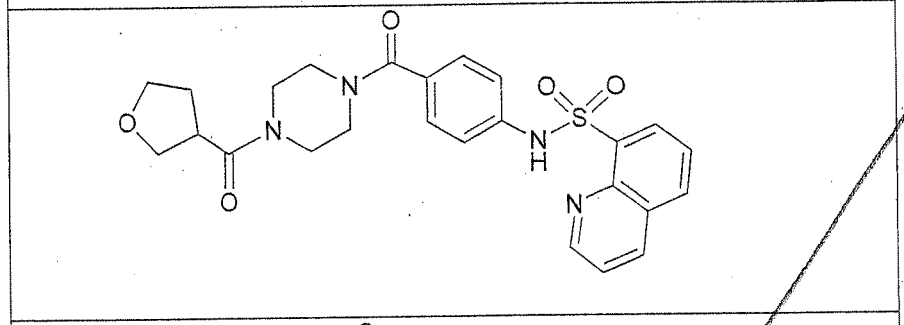


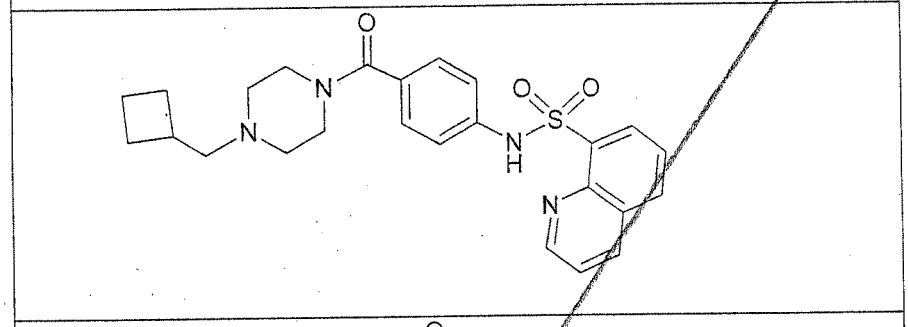


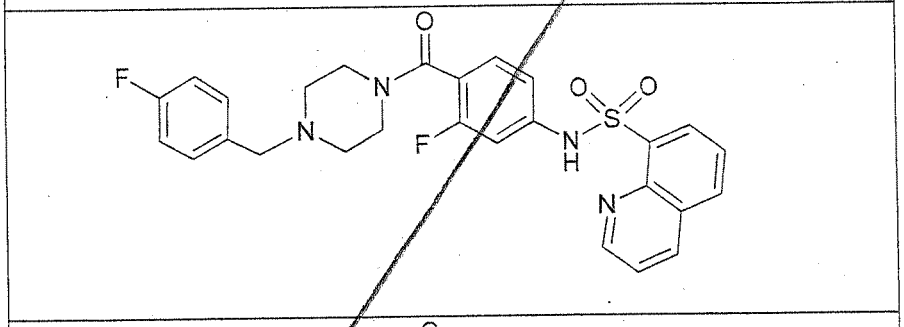


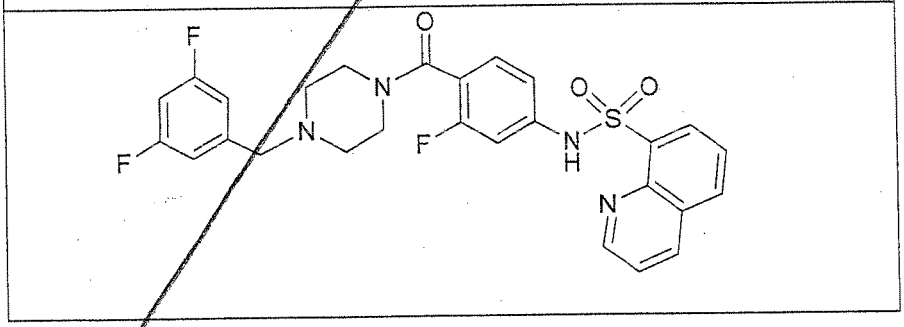


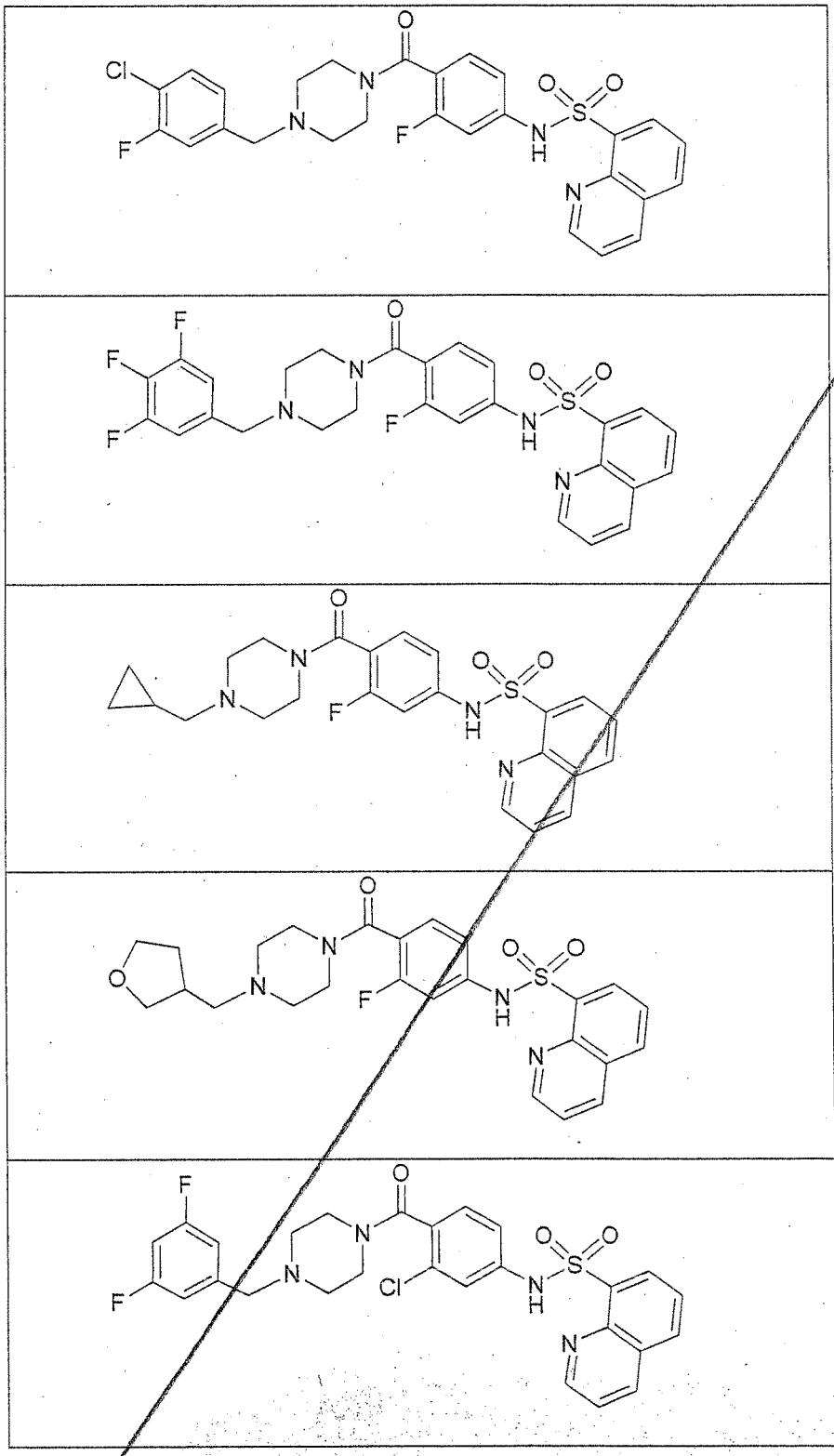


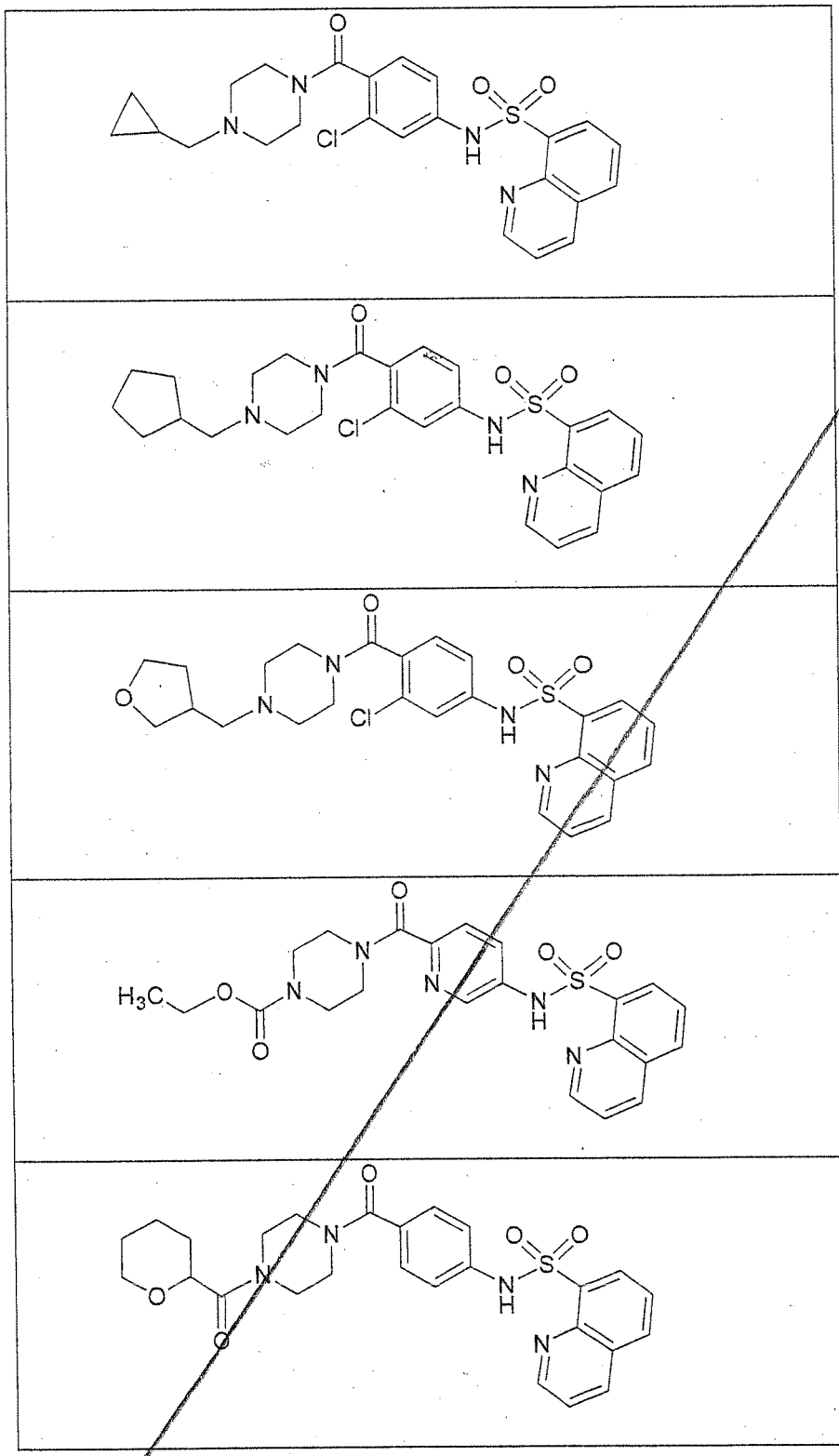


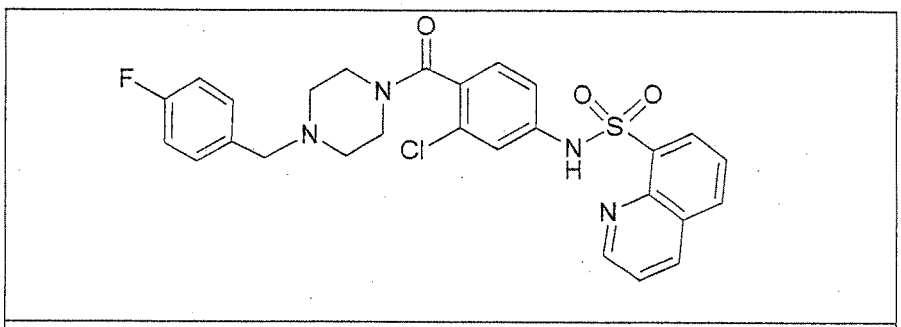


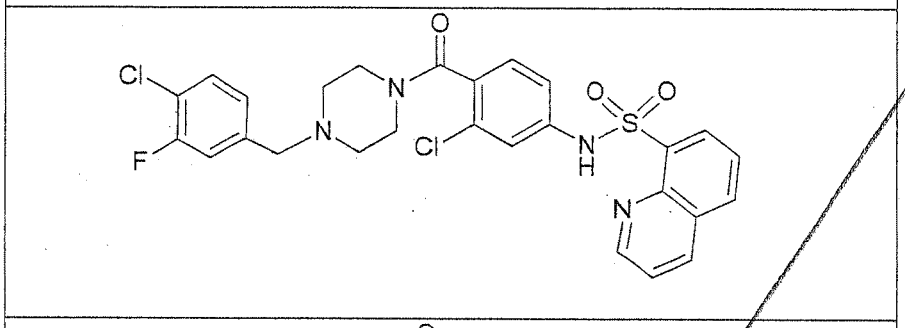


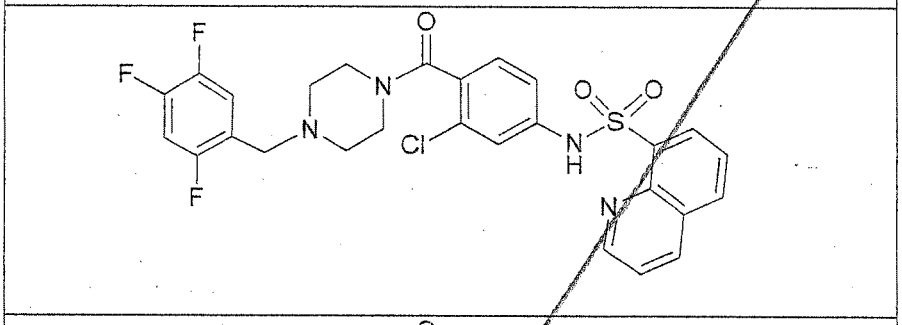


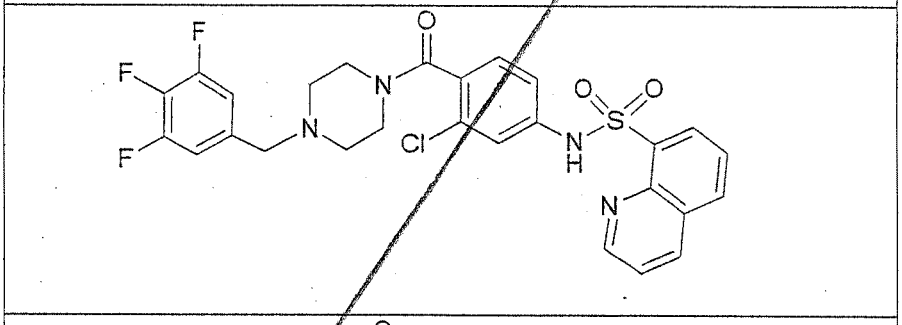


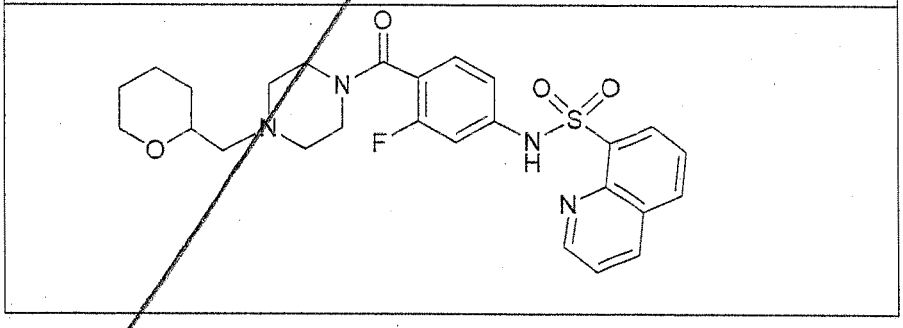


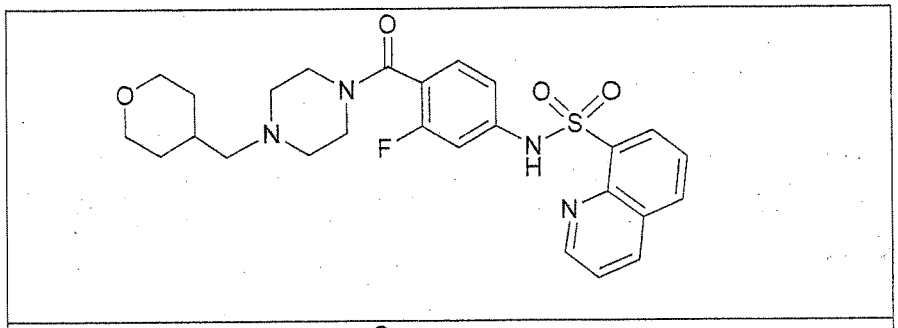


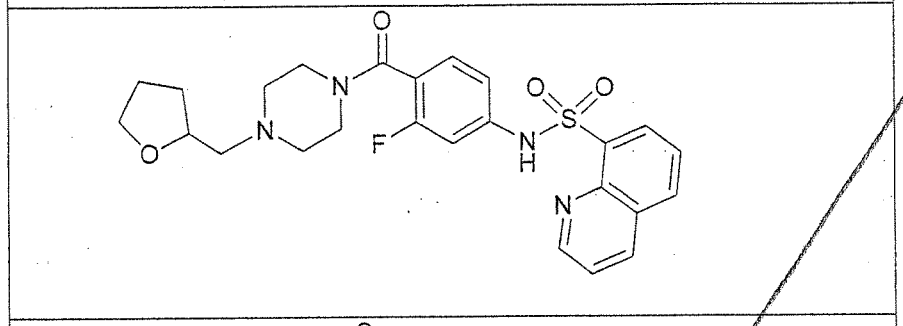


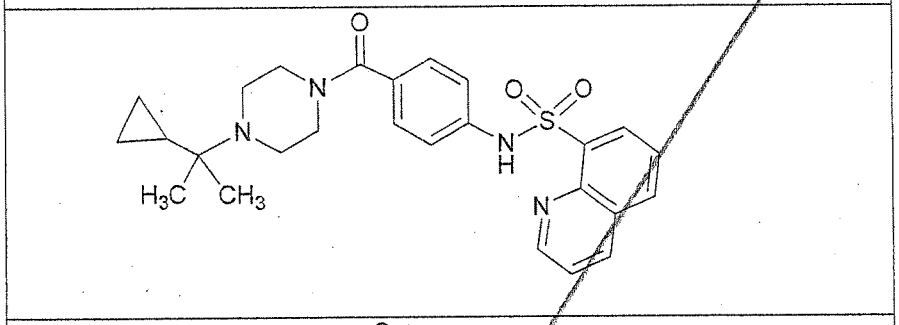


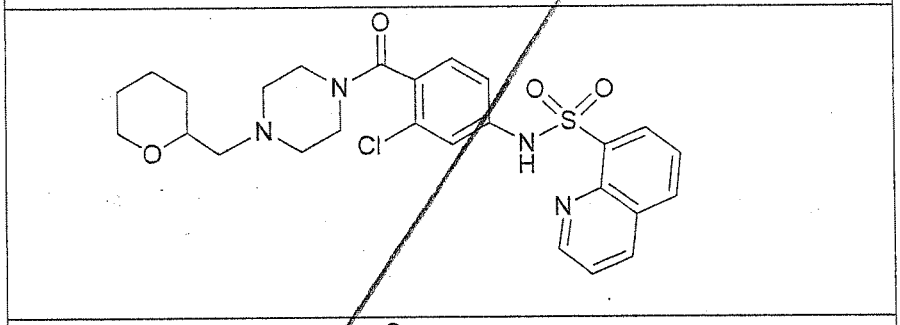


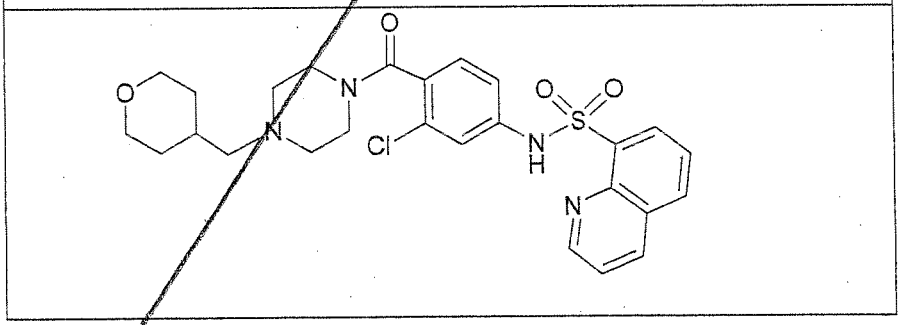


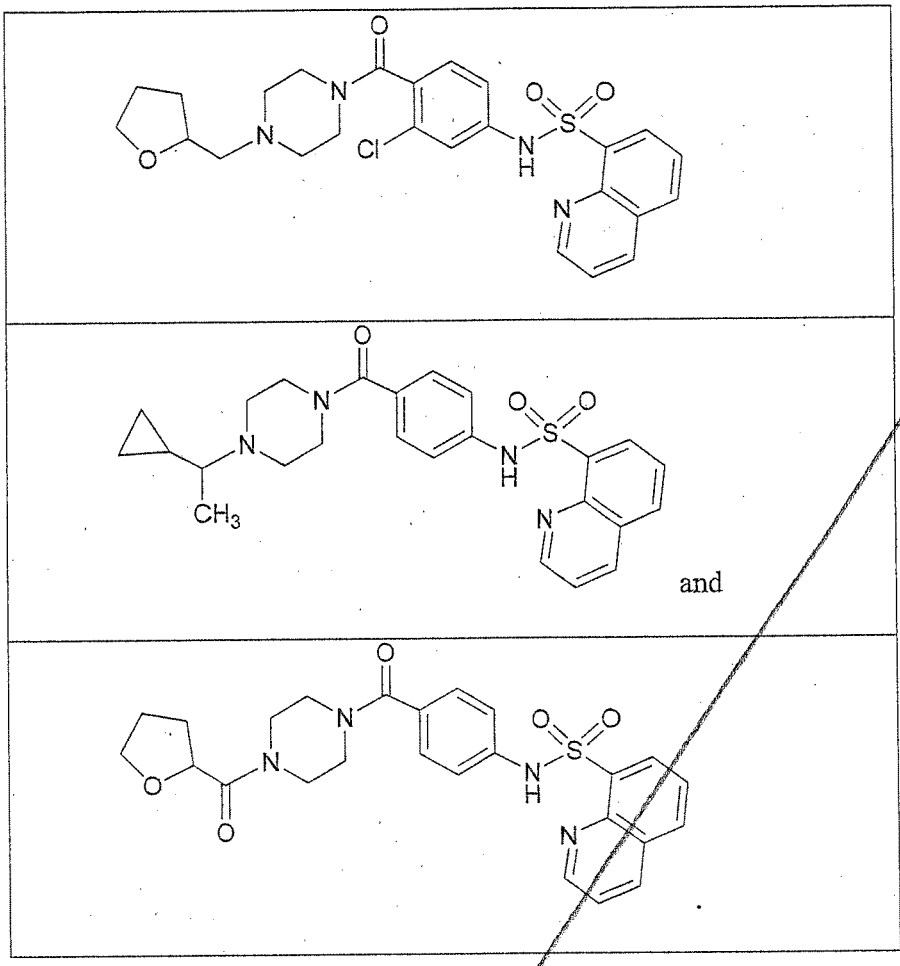






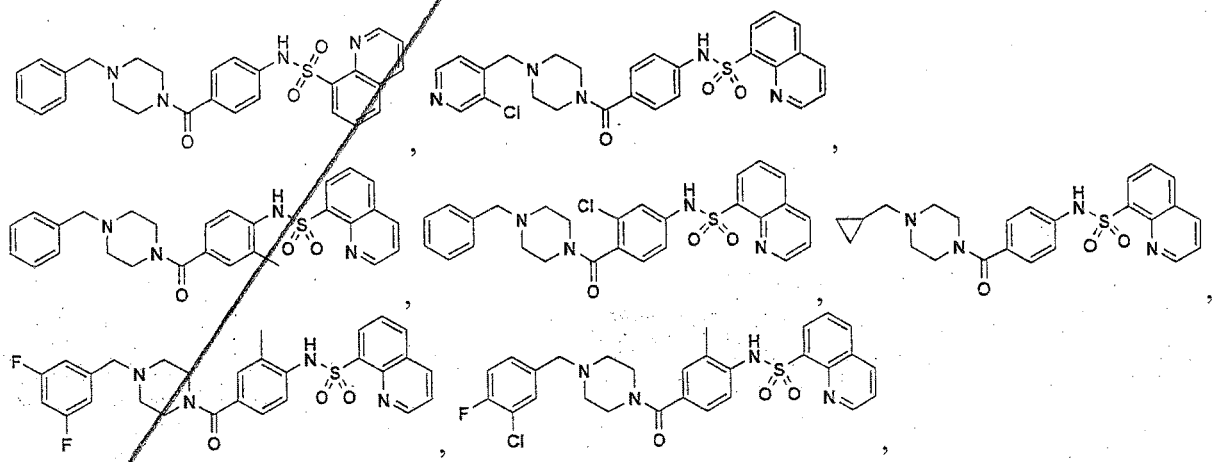


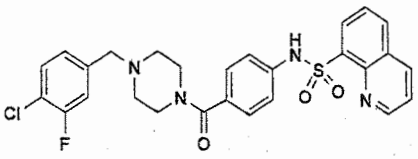
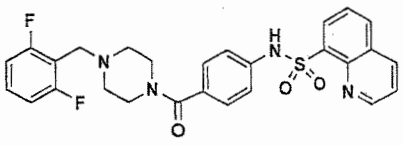
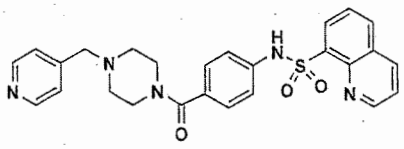
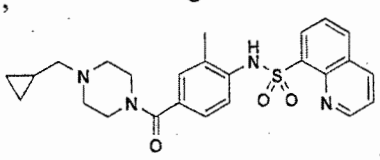
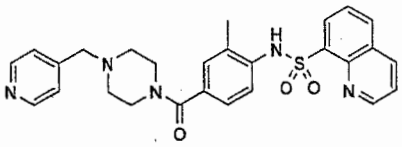
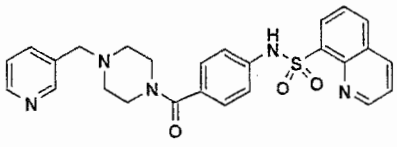
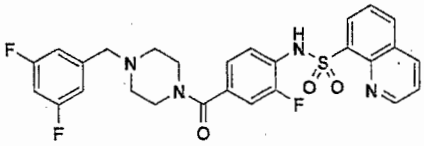
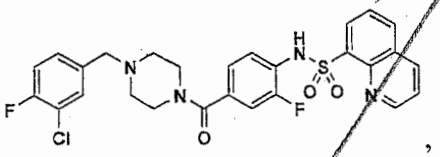
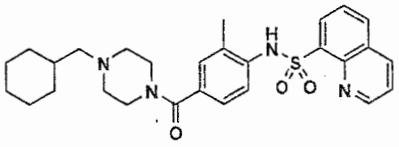
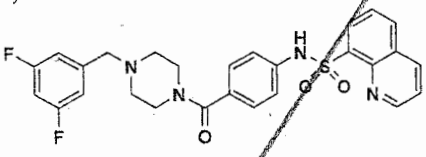
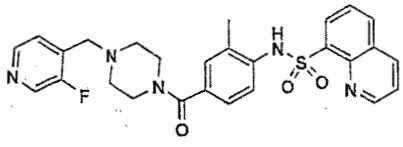
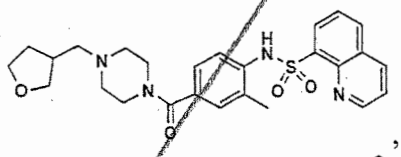
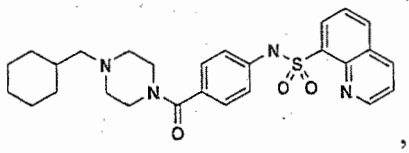
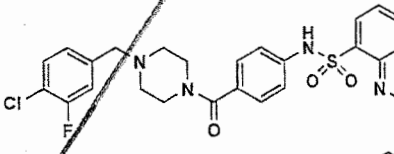
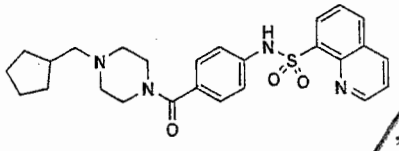
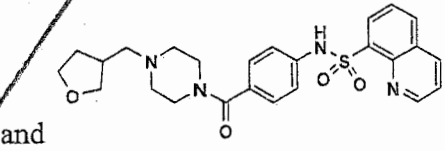
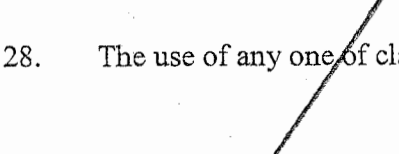
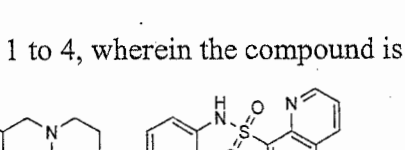




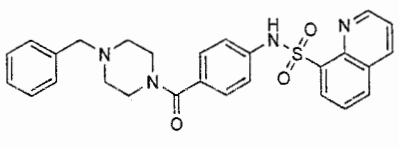
and

27. The use of any one of claims 1 to 4 or a pharmaceutically acceptable salt thereof, wherein the compound is selected from:

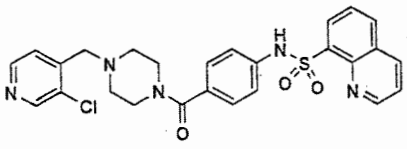




















, and

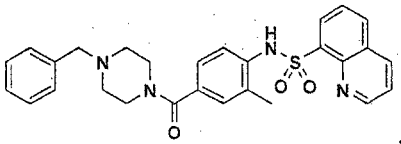
28. The use of any one of claims 1 to 4, wherein the compound is selected from:


.

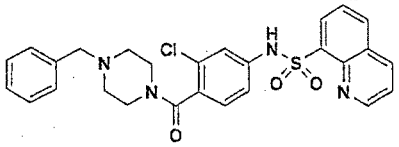
29. The use of any one of claims 1 to 4, wherein the compound is selected from:


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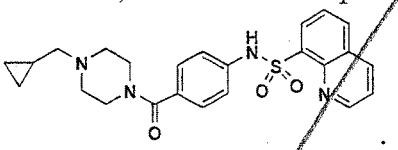
30. The use of any one of claims 1 to 4, wherein the compound is selected from:



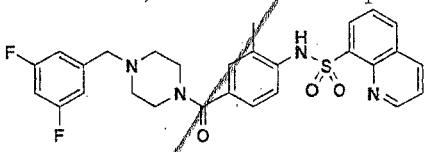
31. The use of any one of claims 1 to 4, wherein the compound is selected from:



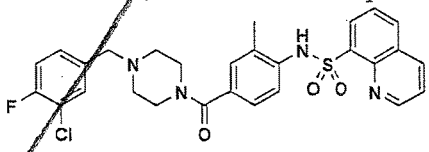
32. The use of any one of claims 1 to 4, wherein the compound is selected from:



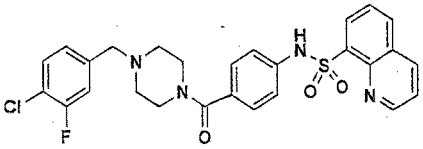
33. The use of any one of claims 1 to 4, wherein the compound is selected from:



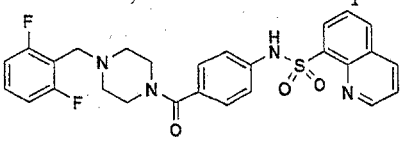
34. The use of any one of claims 1 to 4, wherein the compound is selected from:



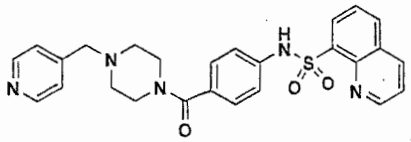
35. The use of any one of claims 1 to 4, wherein the compound is selected from:



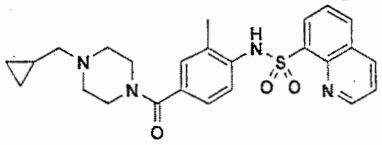
36. The use of any one of claims 1 to 4, wherein the compound is selected from:



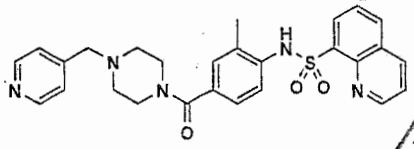
37. The use of any one of claims 1 to 4, wherein the compound is selected from:



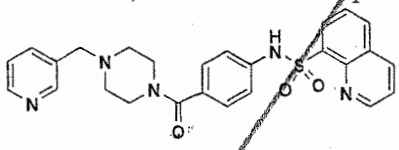
38. The use of any one of claims 1 to 4, wherein the compound is selected from:



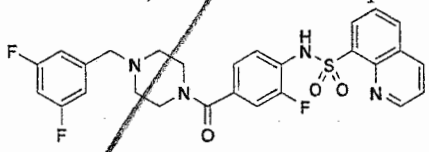
39. The use of any one of claims 1 to 4, wherein the compound is selected from:



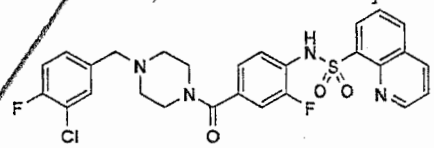
40. The use of any one of claims 1 to 4, wherein the compound is selected from:



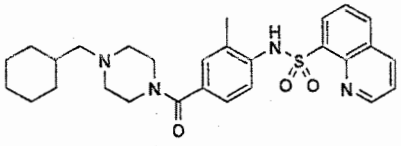
41. The use of any one of claims 1 to 4, wherein the compound is selected from:



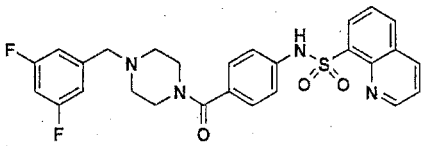
42. The use of any one of claims 1 to 4, wherein the compound is selected from:



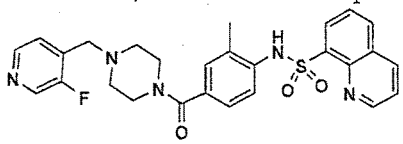
43. The use of any one of claims 1 to 4, wherein the compound is selected from:



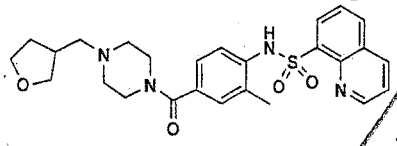
44. The use of any one of claims 1 to 4, wherein the compound is selected from:



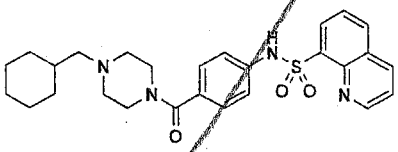
45. The use of any one of claims 1 to 4, wherein the compound is selected from:



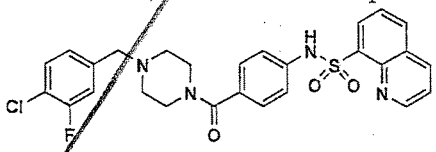
46. The use of any one of claims 1 to 4, wherein the compound is selected from:



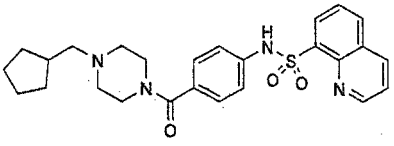
47. The use of any one of claims 1 to 4, wherein the compound is selected from:



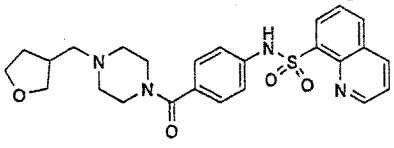
48. The use of any one of claims 1 to 4, wherein the compound is selected from:



49. The use of any one of claims 1 to 4, wherein the compound is selected from:

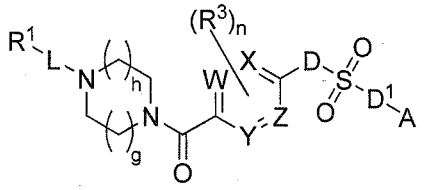


50. The use of any one of claims 1 to 4, wherein the compound is selected from:



What is claimed is

1. Use of a compound in the manufacture of a medicament for increasing the lifetime of red blood cells (RBCs) comprising contacting blood with an effective amount of (1) a compound of formula I or a pharmaceutically acceptable salt thereof; (2) a pharmaceutically acceptable composition comprising a compound of formula I or a pharmaceutically acceptable salt thereof, and a pharmaceutically acceptable carrier,



(I)

wherein:

W, X, Y and Z are each independently selected from CH or N;

D and D^1 are independently selected from a bond or NR^b;

A is optionally substituted aryl or optionally substituted heteroaryl;

L is a bond, -C(O)-, $-(CR^cR^c)_m$-, -OC(O)-, $-(CR^cR^c)_m$-OC(O)-, $-(CR^cR^c)_m$-C(O)-, $-NR^bC(S)$-, or $-NR^bC(O)$- (wherein the point of the attachment to R^1 is on the left-hand side);

R^1 is selected from alkyl, cycloalkyl, aryl, heteroaryl, and heterocyclyl; each of which is substituted with 0-5 occurrences of R^d;

each R^3 is independently selected from halo, haloalkyl, alkyl, hydroxyl and $-OR^a$, or two adjacent R^3 taken together with the carbon atoms to which they are attached form an optionally substituted cyclyl;

each R^a is independently selected from alkyl, acyl, hydroxyalkyl and haloalkyl;

each R^b is independently selected from hydrogen and alkyl;

each R^c is independently selected from hydrogen, halo, alkyl, alkoxy and halo alkoxy or two R^c taken together with the carbon atoms to which they are attached form an optionally substituted cycloalkyl;

each R^d is independently selected from halo, haloalkyl, haloalkoxy, alkyl, alkynyl, nitro, cyano, hydroxyl, $-C(O)R^a$, $-OC(O)R^a$, $-C(O)OR^a$, $-SR^a$, $-NR^aR^b$ and $-OR^a$, or two R^d taken together with the carbon atoms to which they are attached form an optionally substituted heterocyclyl;

n is 0, 1, or 2;

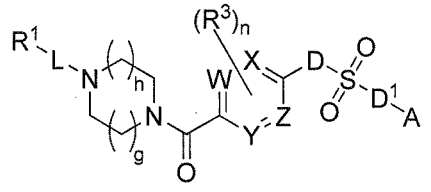
m is 1, 2 or 3;

h is 0, 1, 2; and

g is 0, 1 or 2.

2. The use of claim 1, wherein the compound of formula I or a pharmaceutically acceptable salt thereof, or the pharmaceutically acceptable composition comprising a compound of formula I or a pharmaceutically acceptable salt thereof, and a pharmaceutically acceptable carrier is to be administered to a subject suffering from pyruvate kinase deficiency.
3. The use of claim 1, wherein the lifetime of the red blood cells is increased.
4. Use of a compound in the manufacture of a medicament for reducing 2,3-diphosphoglycerate (2,3-DPG) levels or preventing an increase in 2,3-DPG levels in blood comprising contacting blood with an effective amount of (1) a compound of formula I or a pharmaceutically acceptable salt thereof; (2) a pharmaceutically acceptable composition comprising a compound of formula I or a pharmaceutically acceptable salt thereof, and a pharmaceutically acceptable carrier; wherein formula I is as defined in claim 1, and wherein the medicament is formulated for administration to a subject in need thereof.
5. Use of a compound in the manufacture of a medicament for treating hemolytic anemia comprising (1) a compound of formula I or a pharmaceutically acceptable salt thereof; or (2) a pharmaceutically acceptable composition comprising a compound of formula I or a pharmaceutically acceptable salt thereof, and a pharmaceutically acceptable carrier; wherein formula I is as defined in claim 1, and wherein the medicament is formulated for administration to a subject in need thereof.
6. The use according to claim 5, wherein the hemolytic anemia is hereditary non-spherocytic hemolytic anemia.
7. Use of a compound in the manufacture of a medicament for treating pyruvate kinase deficiency (PKD) in a subject comprising (1) a compound of formula I or a pharmaceutically acceptable salt thereof; or (2) a pharmaceutically acceptable composition comprising a compound of formula I or a pharmaceutically acceptable salt thereof, and a pharmaceutically acceptable carrier; wherein formula I is as defined in claim 1, and wherein the medicament is formulated for administration to a subject in need thereof.

8. Use of a compound in the manufacture of a medicament for treating sickle cell anemia comprising (1) a compound of formula I or a pharmaceutically acceptable salt thereof; or (2) a pharmaceutically acceptable composition comprising a compound of formula I or a pharmaceutically acceptable salt thereof, and a pharmaceutically acceptable carrier; wherein formula I is as defined in claim 1, and wherein the medicament is formulated for administration to a subject in need thereof.
9. Use of a compound in the manufacture of a medicament for treating thalassemia, e.g., beta-thalassemia; hereditary spherocytosis; hereditary elliptocytosis; abetalipoproteinemia or Bassen-Kornzweig syndrome; paroxysmal nocturnal hemoglobinuria; acquired hemolytic anemia, e.g., congenital anemias, e.g., enzymopathies; or anemia of chronic diseases comprising (1) a compound of formula I or a pharmaceutically acceptable salt thereof; or (2) a pharmaceutical composition comprising a compound of formula I or a pharmaceutically acceptable salt thereof, and a pharmaceutically acceptable carrier; wherein formula I is as defined in claim 1, and wherein the medicament is formulated for administration to a subject in need thereof.
10. The use of any one of claims 1 to 9, wherein the compound is represented by formula (I), wherein:



(I)

W, X, Y and Z are each independently selected from CH or N;

D and D^1 are independently selected from a bond or NR^b;

A is optionally substituted bicyclic heteroaryl;

L is a bond, -C(O)-, $-(CR^cR^c)_m$-, -OC(O)-, $-(CR^cR^c)_m$-OC(O)-, $-(CR^cR^c)_m$-C(O)-, $-NR^bC(S)$-, or $-NR^bC(O)$- (wherein the point of the attachment to R^1 is on the left-hand side);

R^1 is selected from alkyl, cycloalkyl, aryl, heteroaryl, and heterocyclyl; each of which is substituted with 0-5 occurrences of R^d;

each R^3 is independently selected from halo, haloalkyl, alkyl, hydroxyl and $-OR^a$ or two adjacent R^3 taken together with the carbon atoms to which they are attached form an optionally substituted cyclyl;

each R^a is independently selected from alkyl, acyl, hydroxyalkyl and haloalkyl;

each R^b is independently selected from hydrogen and alkyl;

each R^c is independently selected from hydrogen, halo, alkyl, alkoxy and halo alkoxy or two R^c taken together with the carbon atoms to which they are attached form an optionally substituted cycloalkyl;

each R^d is independently selected from halo, haloalkyl, haloalkoxy, alkyl, alkynyl, nitro, cyano, hydroxyl, $-C(O)R^a$, $-OC(O)R^a$, $-C(O)OR^a$, $-SR^a$, $-NR^aR^b$ and $-OR^a$, or two R^d taken together with the carbon atoms to which they are attached form an optionally substituted heterocyclyl;

n is 0, 1, or 2;

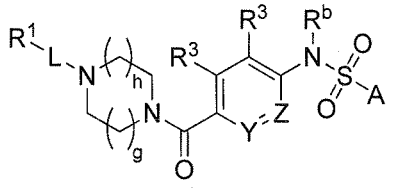
m is 1, 2 or 3;

h is 0, 1, 2; and

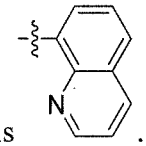
g is 0, 1 or 2.

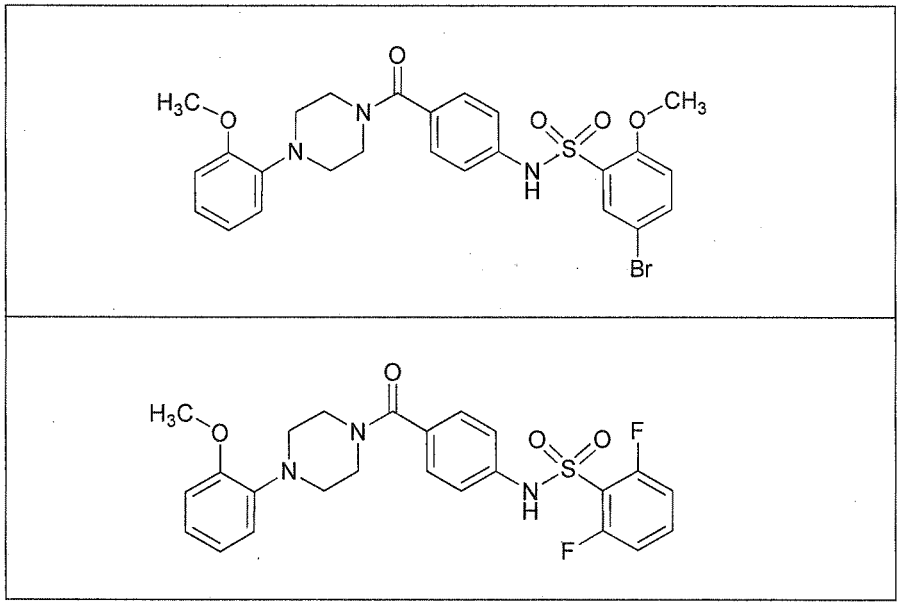
11. The use of claim 10, wherein h is 1 and g is 1.
12. The use of claim 10, wherein W, X, Y and Z are CH.
13. The use of claim 10, wherein D is NR^b and D^1 is a bond.
14. The use of claim 13, wherein R^b is H, methyl or ethyl.
15. The use of claim 10, wherein L is a bond, $-(CR^cR^c)_m-$, $-NR^bC(O)-$, $-(CR^cR^c)_m-C(O)-$, $-C(O)-$, or $-O(CO)-$.
16. The use of claim 15, wherein L is a bond and R^1 is alkyl, aryl or heteroaryl substituted with 0-5 occurrences of R^d.
17. The use of claim 15, wherein L is $-(CR^cR^c)_m-$ and R^1 is cycloalkyl, aryl, heteroaryl or heterocyclyl substituted with 0-5 occurrences of R^d.
18. The use of claim 15, wherein L is $-NR^bC(O)-$, R^b is hydrogen and R^1 is aryl substituted with 0-5 occurrences of R^d.
19. The use of claim 15, wherein L is $-(CR^cR^c)_m-C(O)-$ and R^1 is cycloalkyl, aryl or heteroaryl substituted with 0-5 occurrencs of R^d.
20. The use of claim 15, wherein L is $-C(O)-$ and R^1 is aryl, alkyl, or heteroaryl substituted with 0-5 occurrencs of R^d.
21. The use of claim 15, wherein L is $-OC(O)-$ and R^1 is alkyl, aryl or heterocyclyl substituted with 0-5 occurrences of R^d.

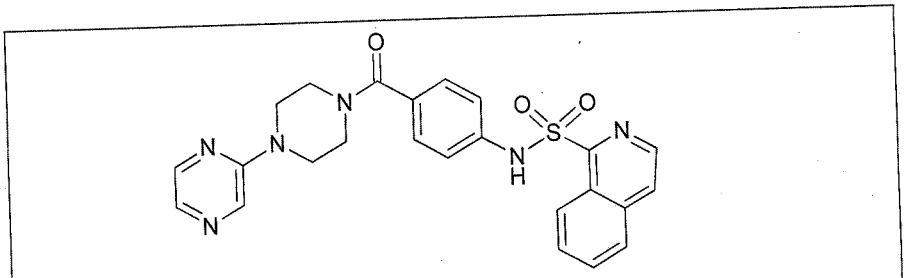
22. The use of claim 15, wherein L is $-(CR^cR^c)_m-OC(O)-$ and R^1 is heterocyclyl or cycloalkyl substituted with 0-5 occurrences of R^d.
23. The use of claim 10, wherein n is 0.
24. The use of claim 10, wherein n is 1 and R^3 is CH_3, CH_2CH_3, OCH_3, OCH_2CH_3, OH, F, Cl, or CF_3.
25. The use of any one of claims 1 to 9, wherein the compound is represented by formula (Id):

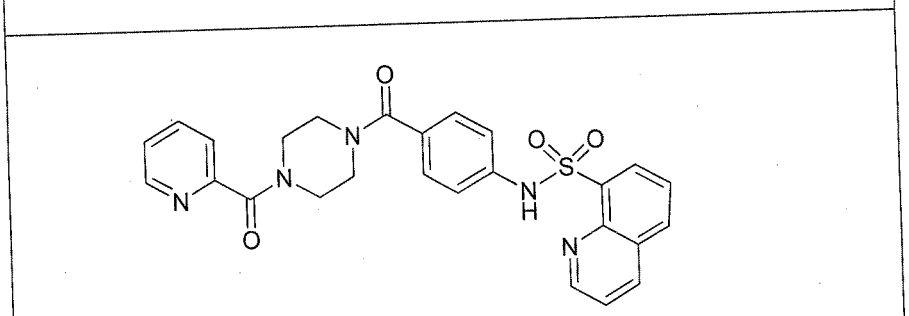


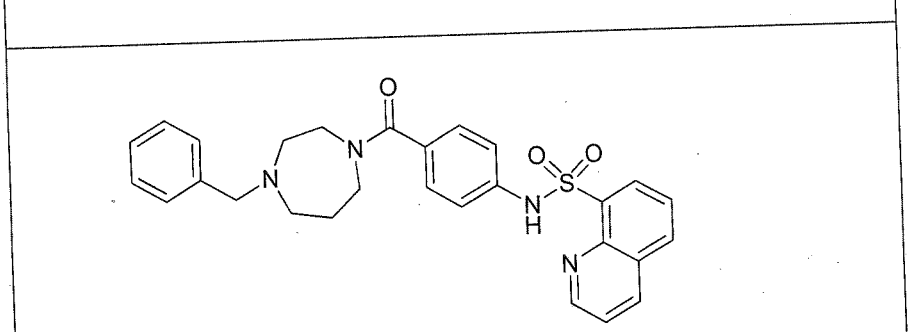
(Id).

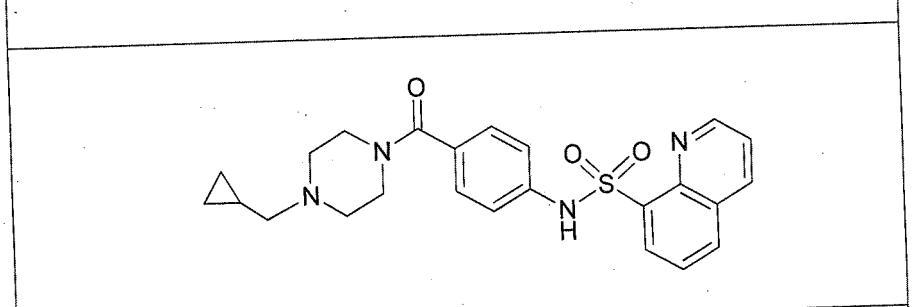
26. The use of claim 25, wherein A is optionally substituted quinolinyl.
27. The use of claim 25, wherein A is .
28. The use of any one of claims 1 to 9, wherein the compound is selected from:

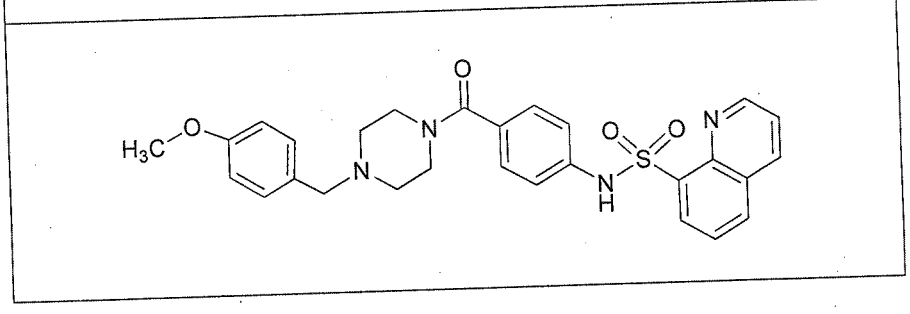


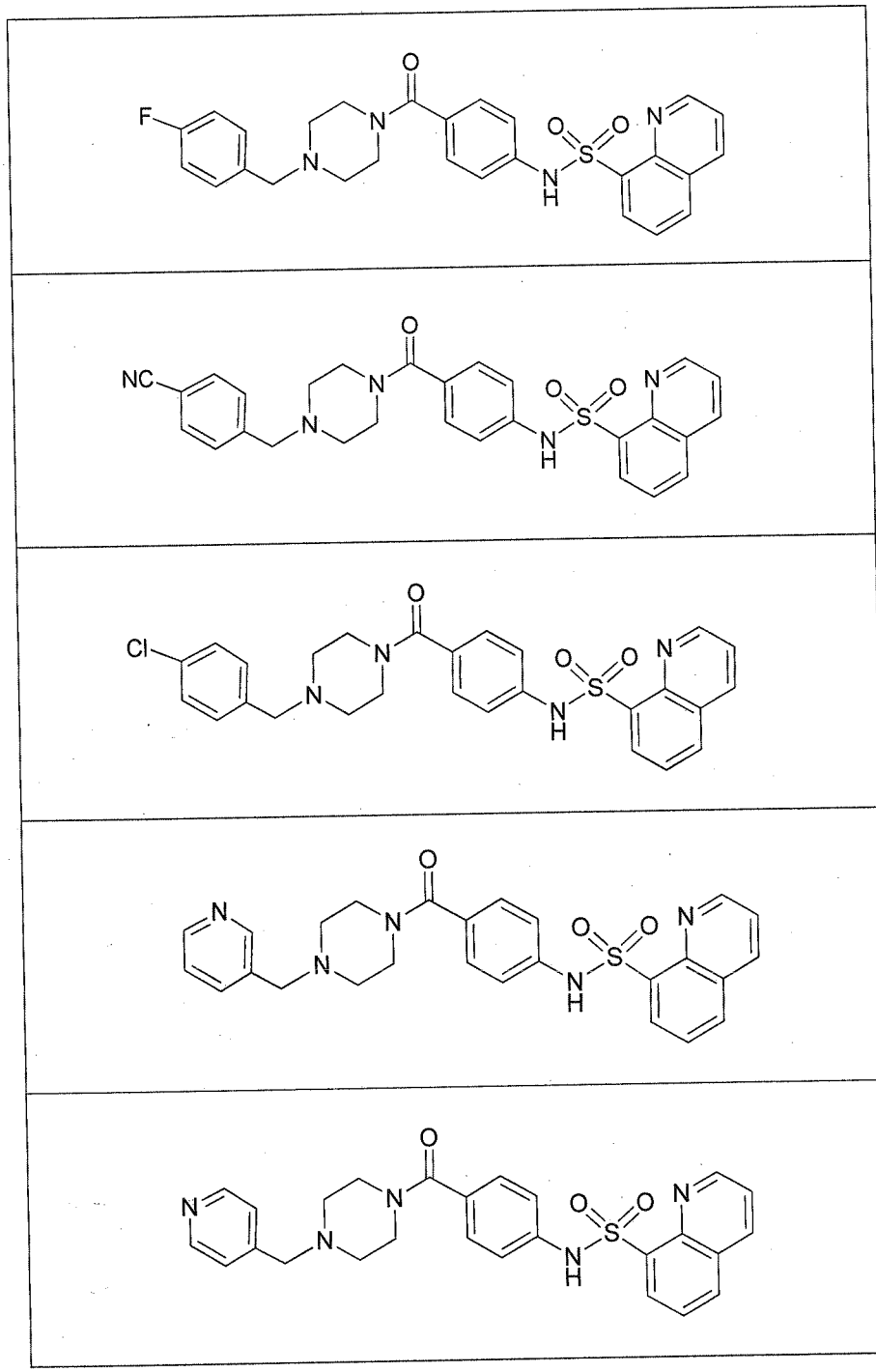


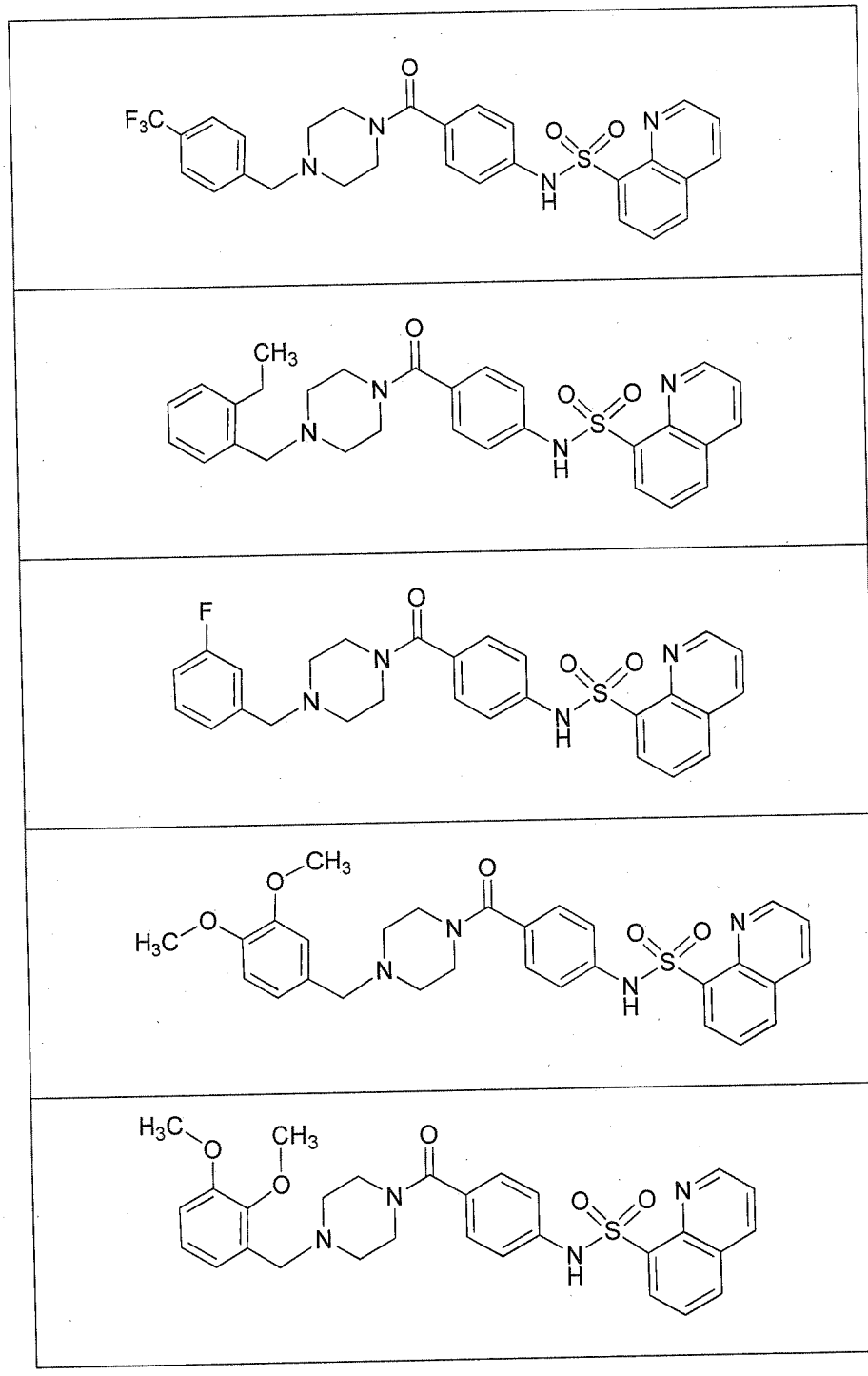


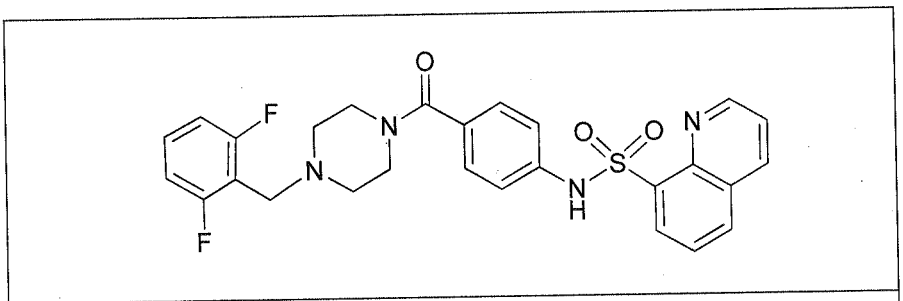


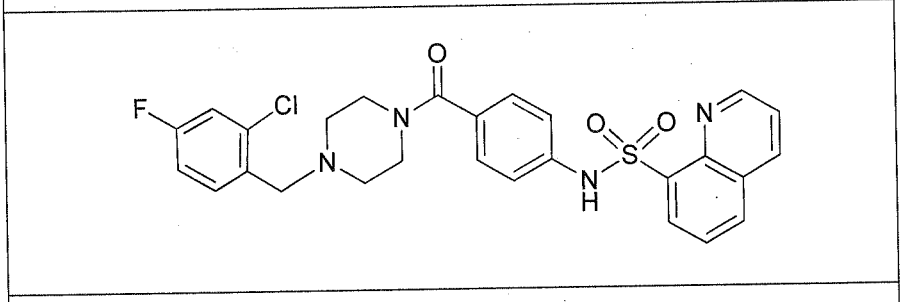


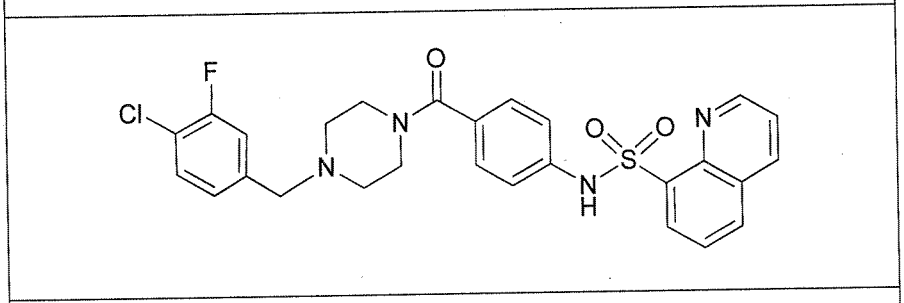


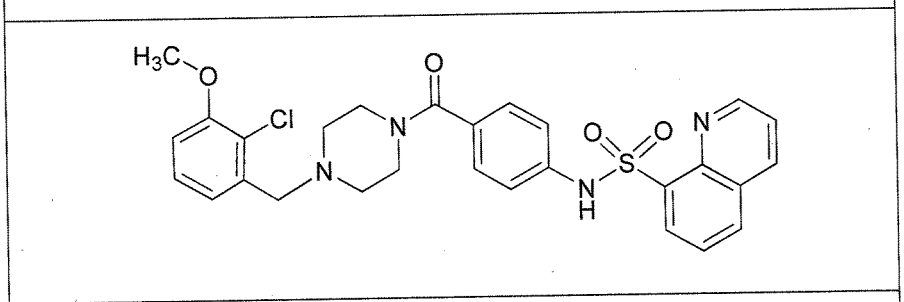


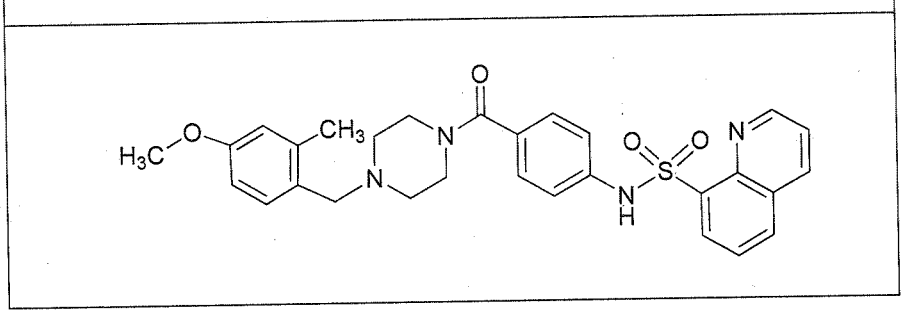


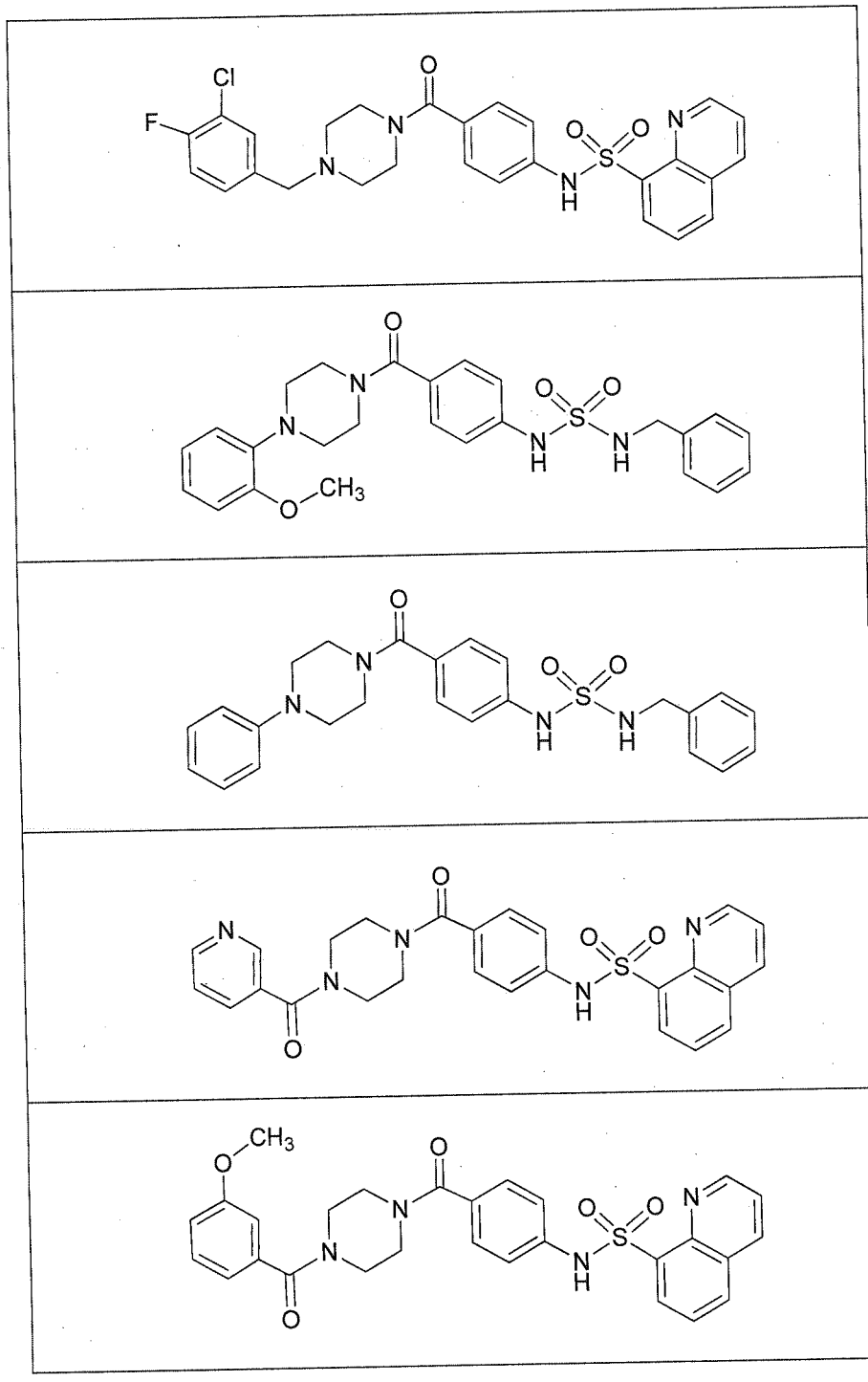


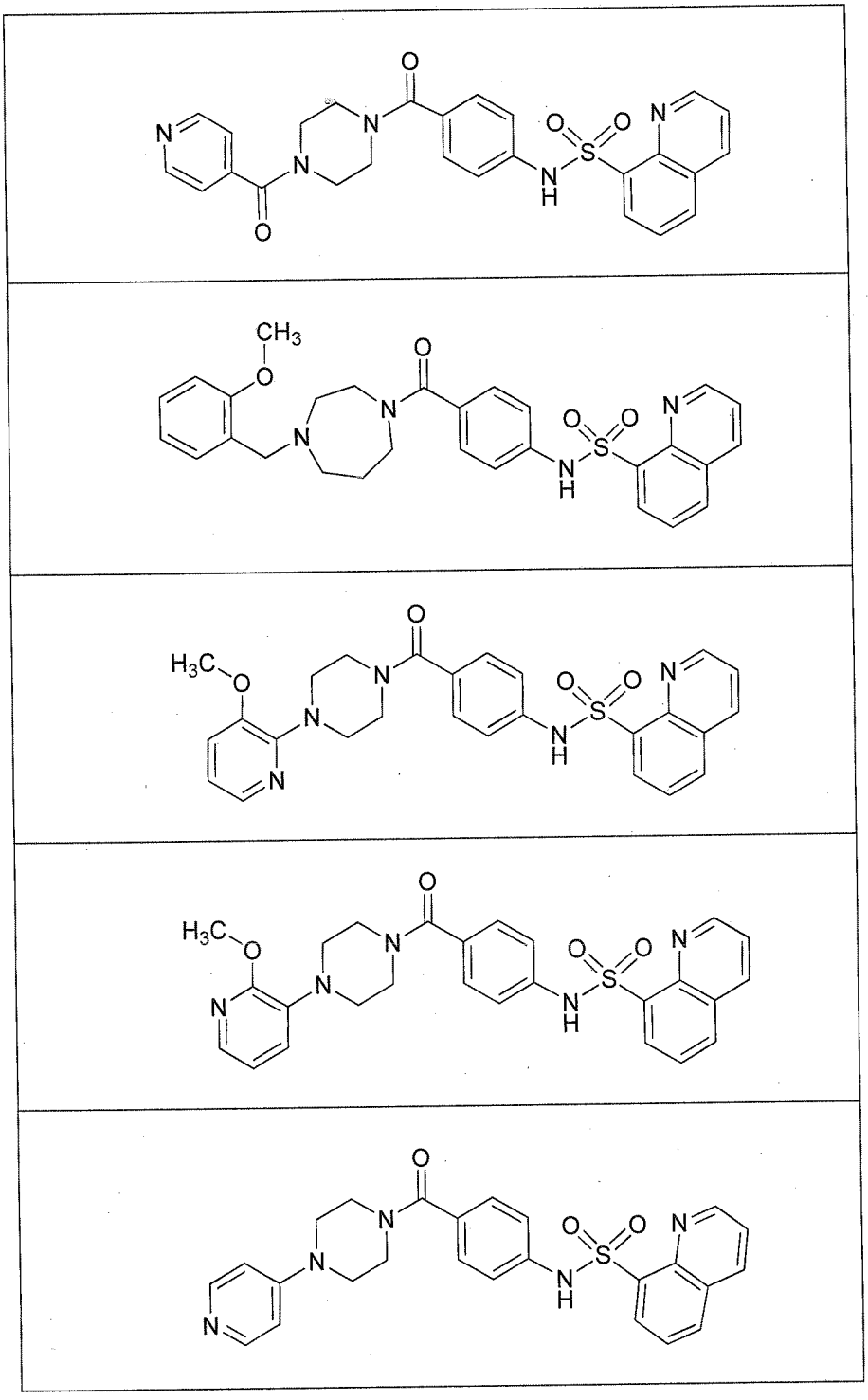


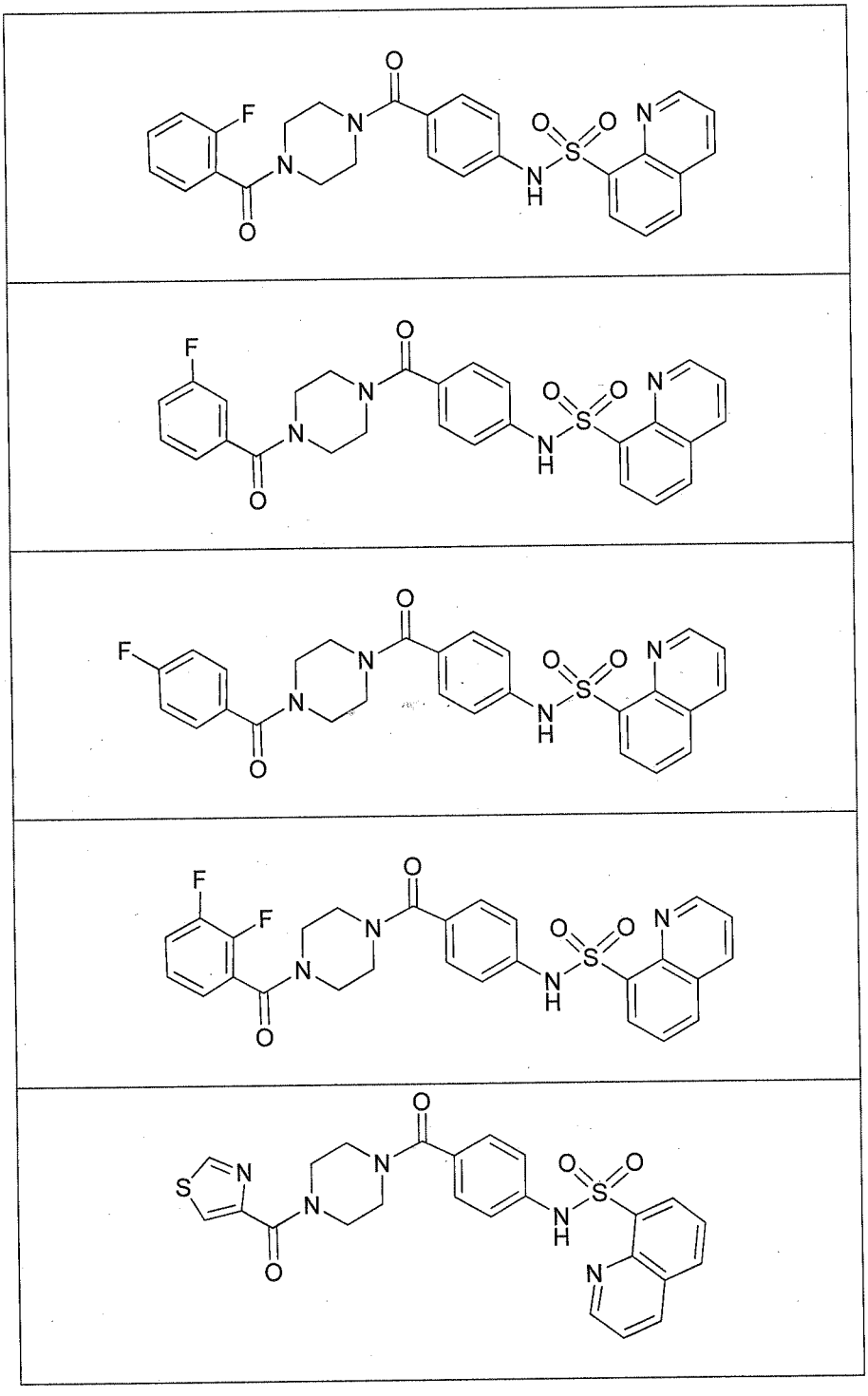


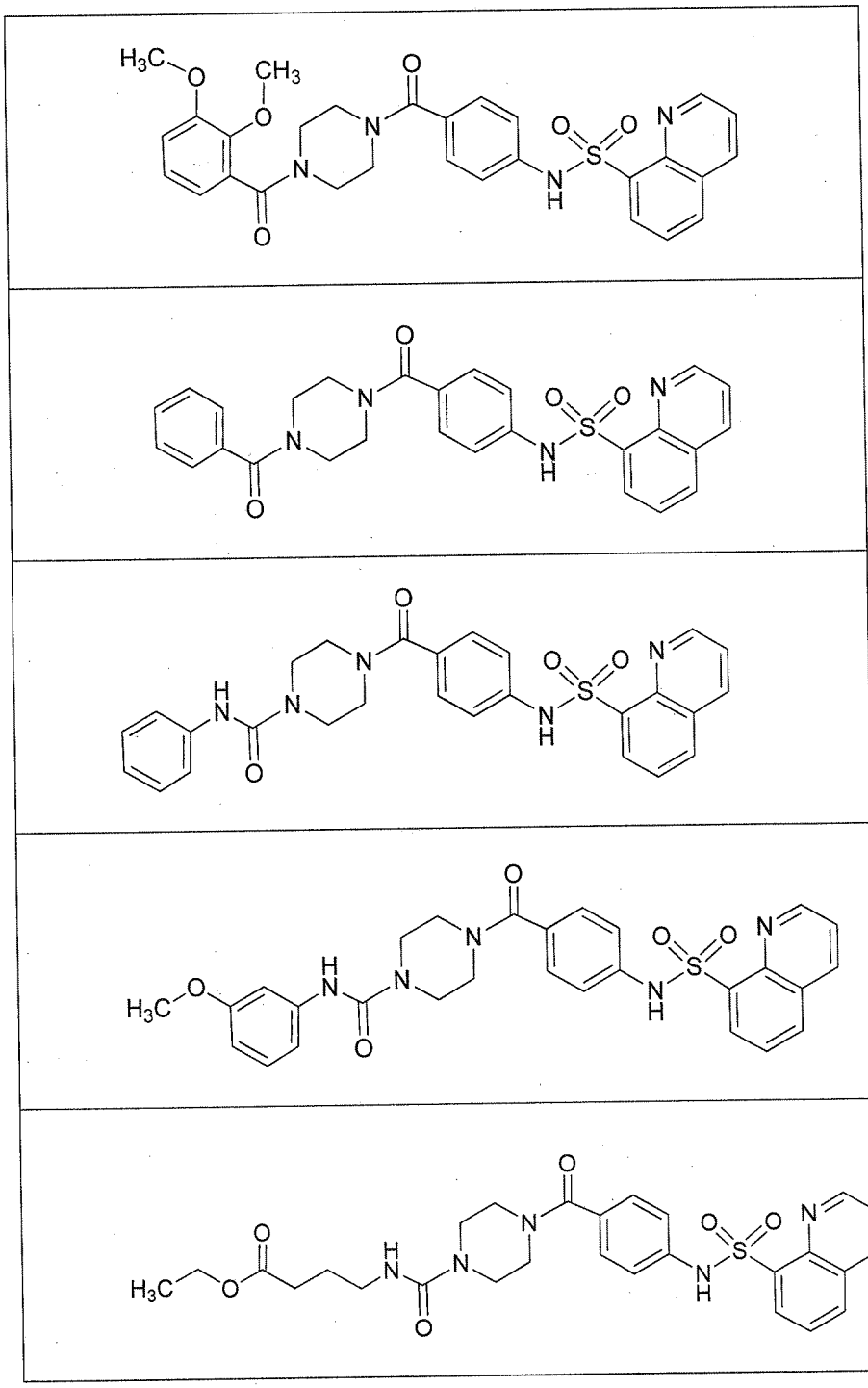


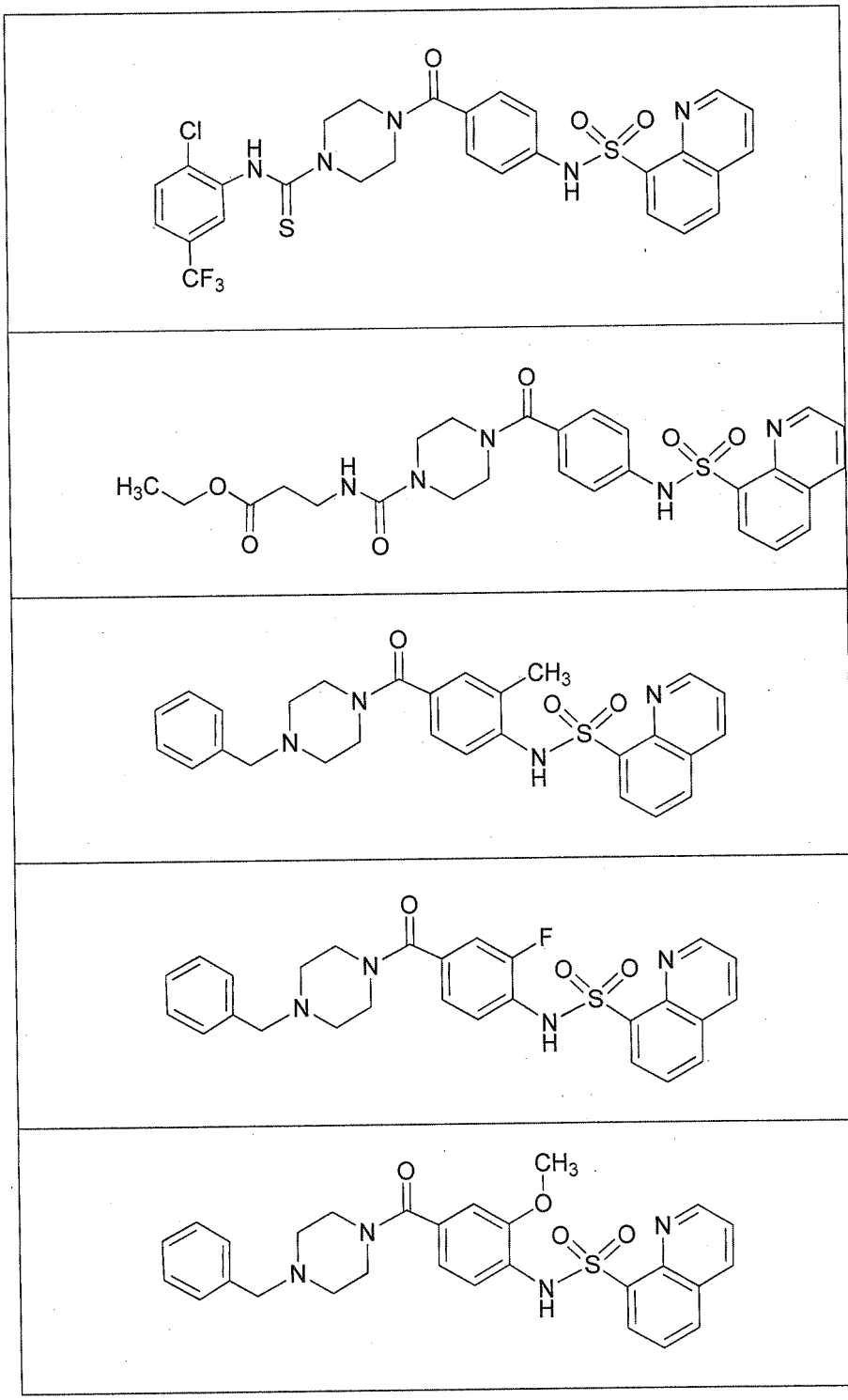


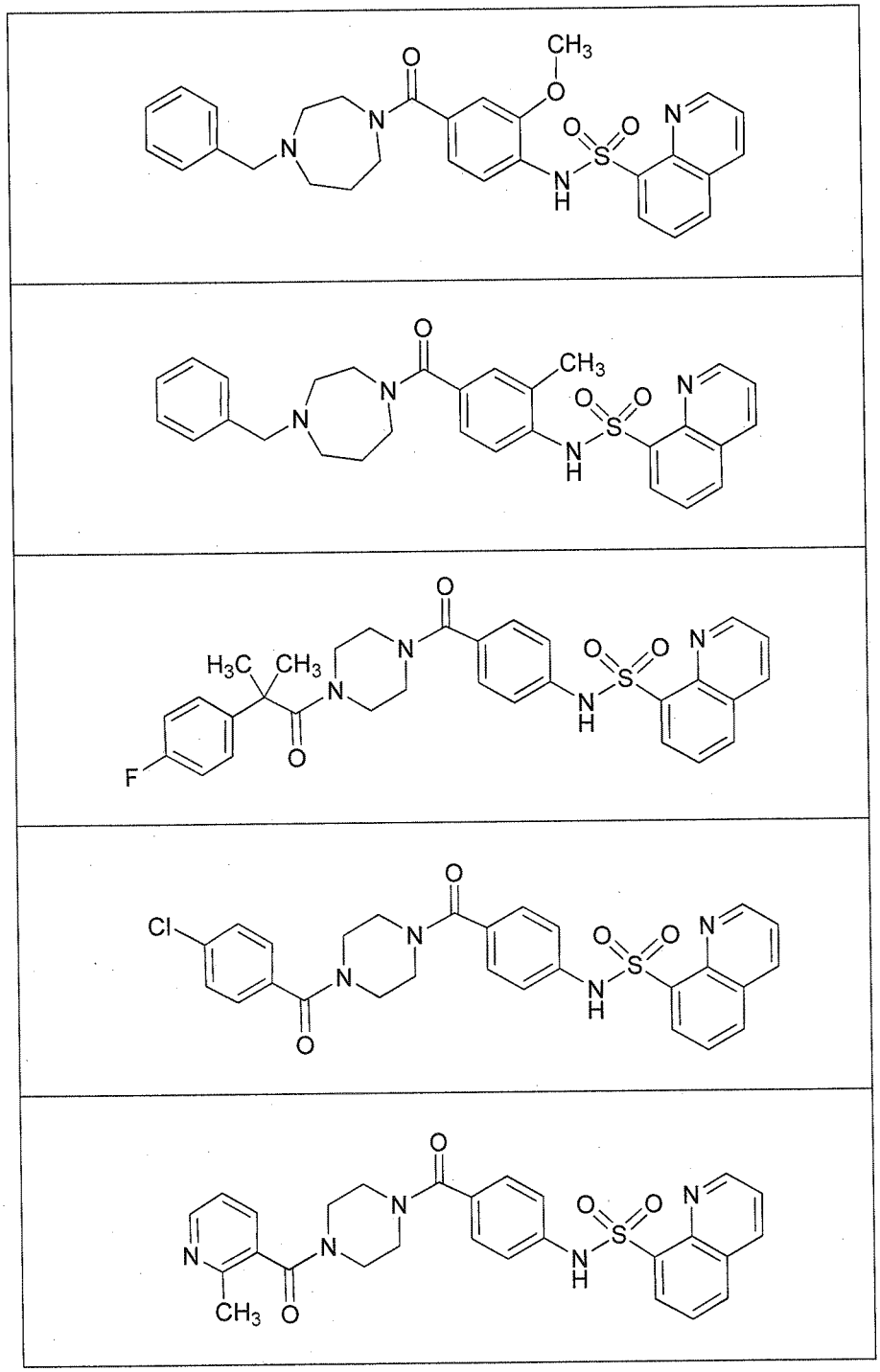


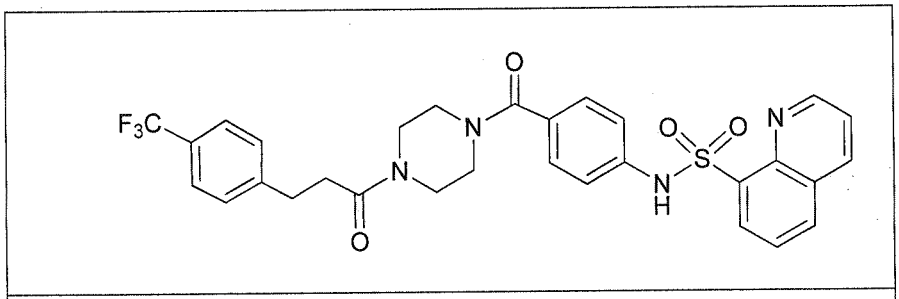


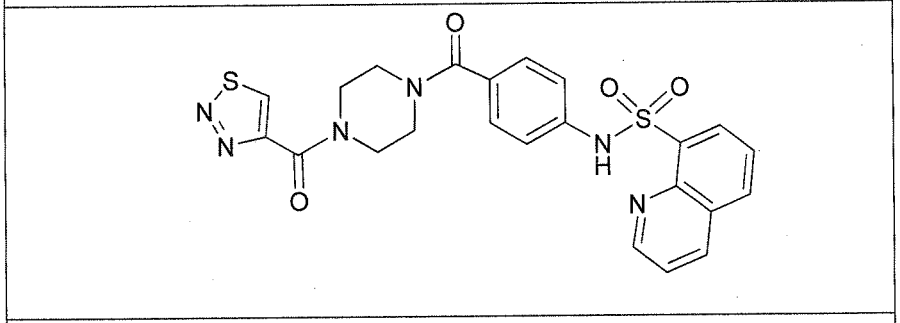


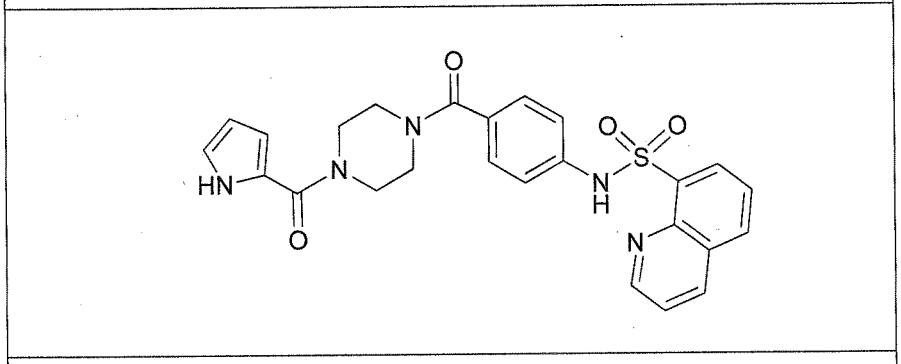


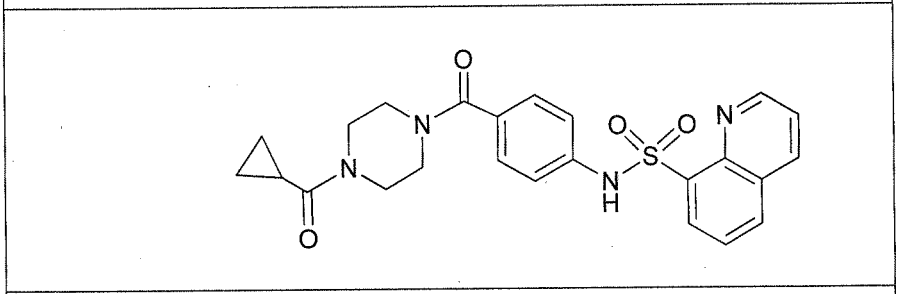


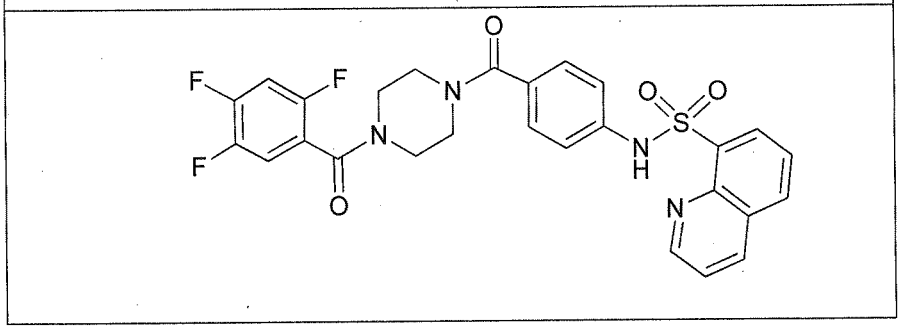


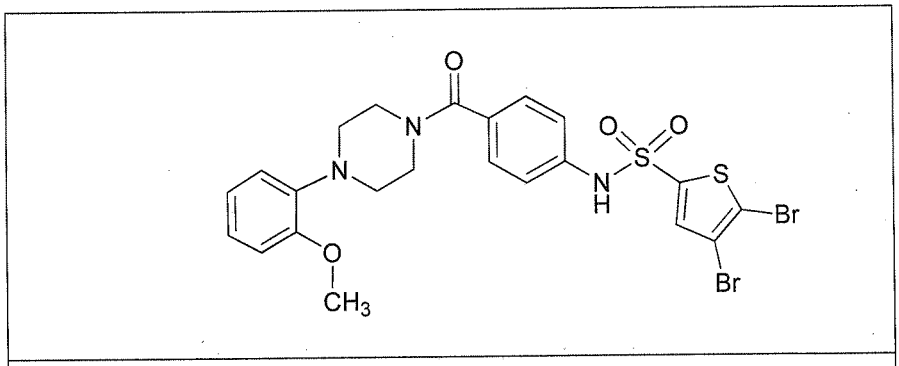


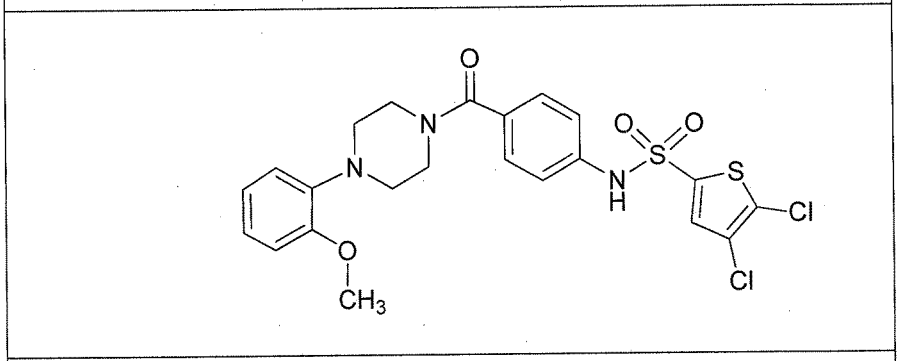


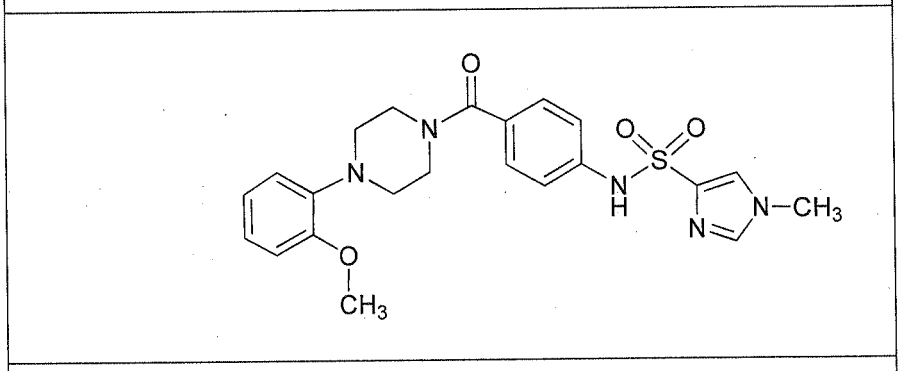


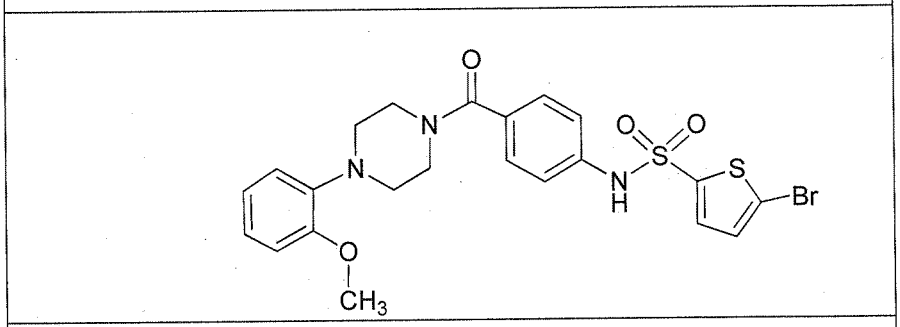


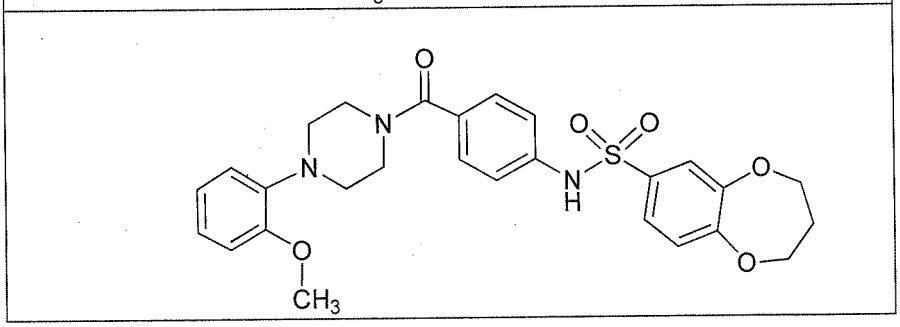


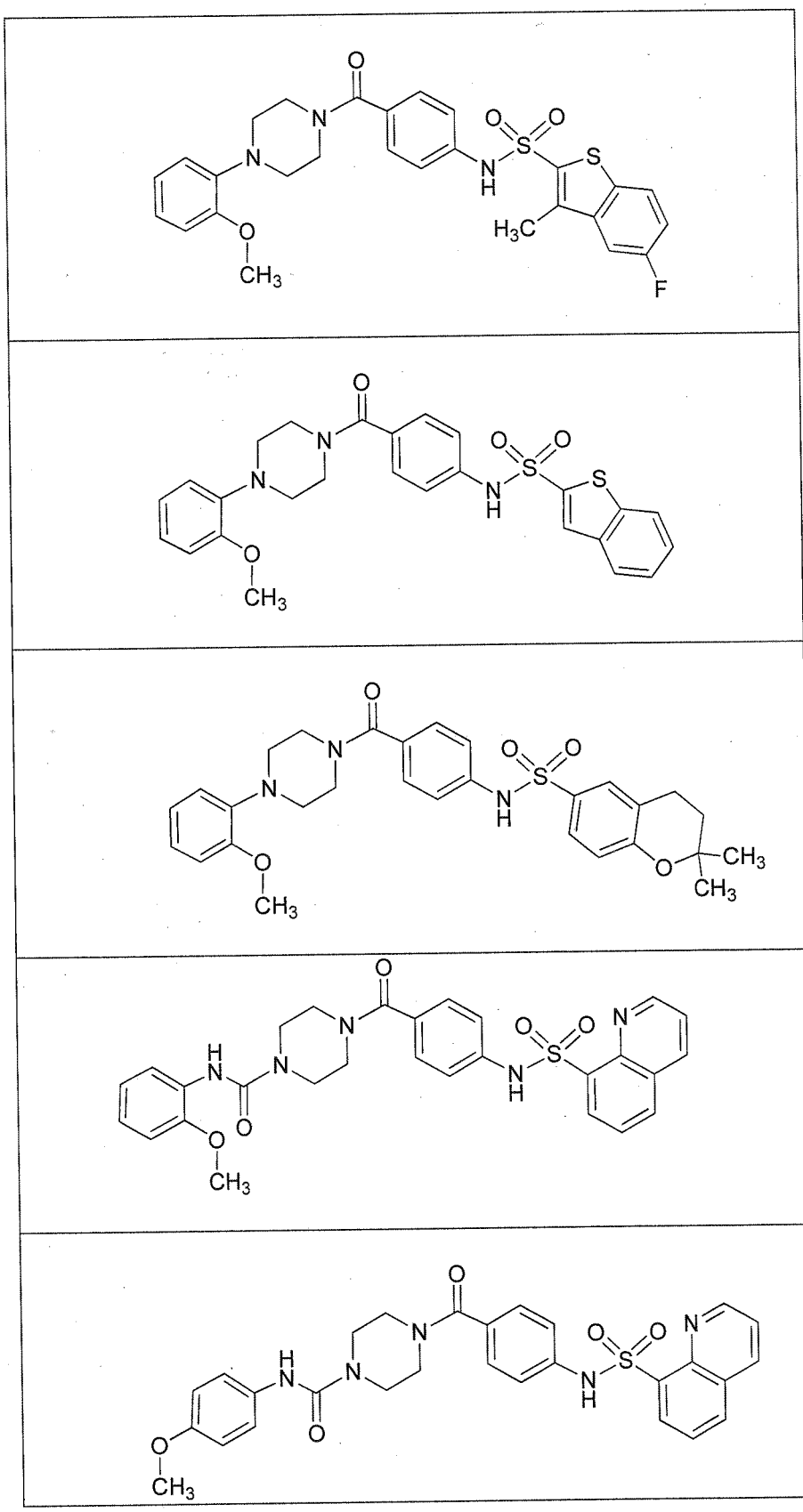


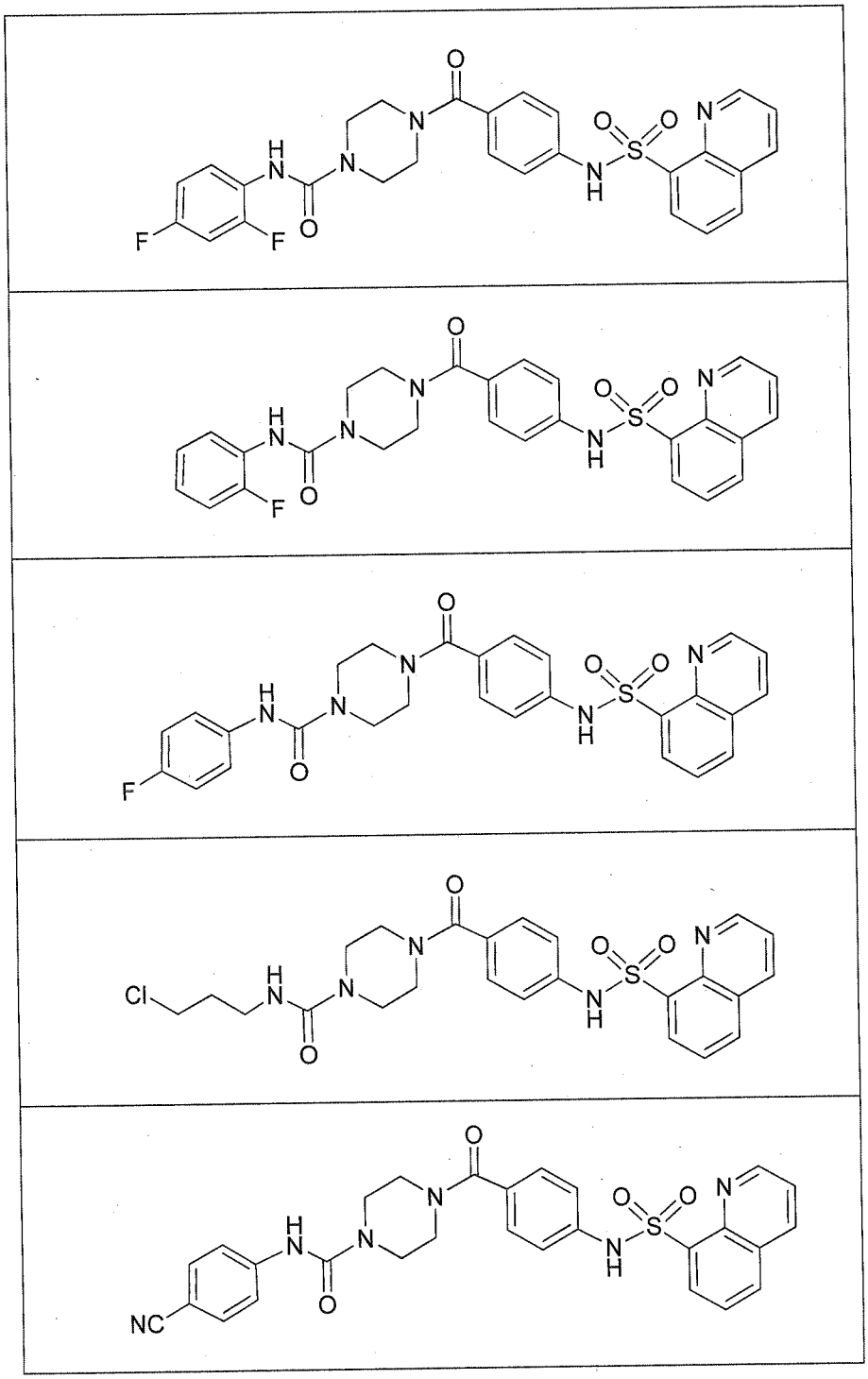


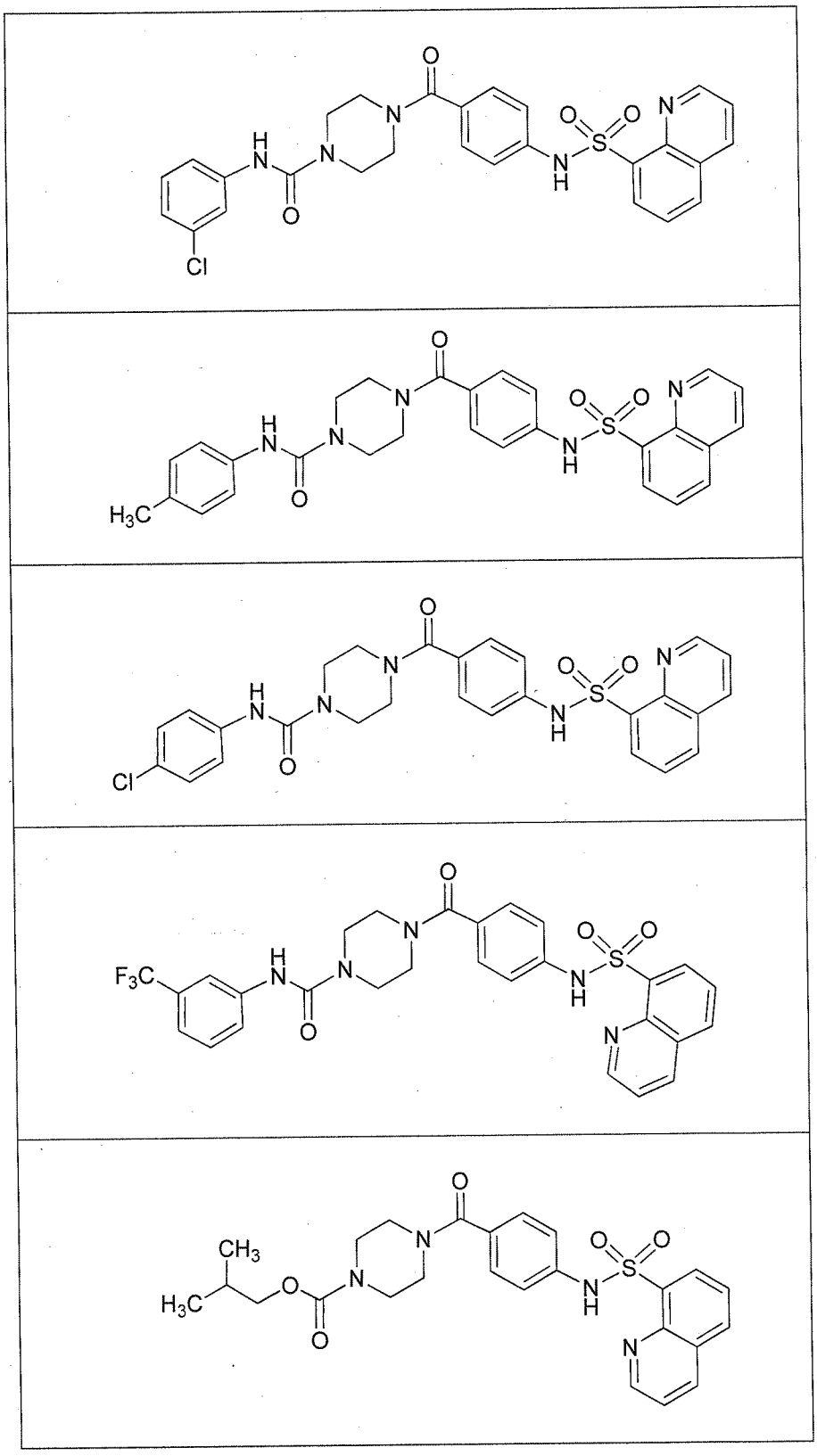


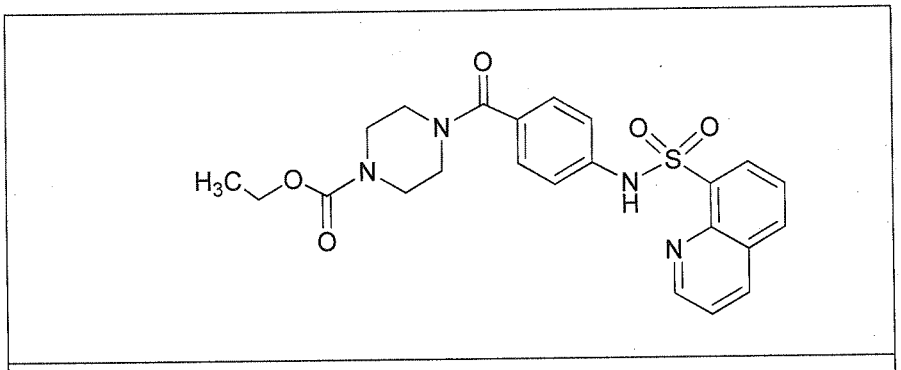


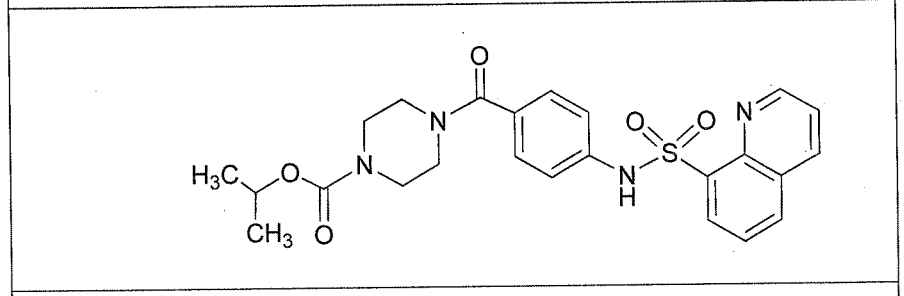


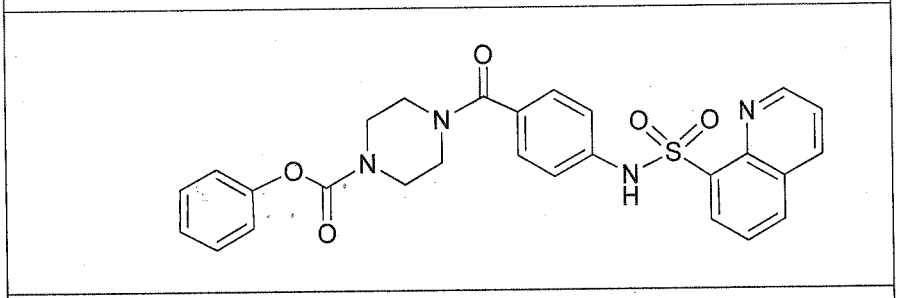


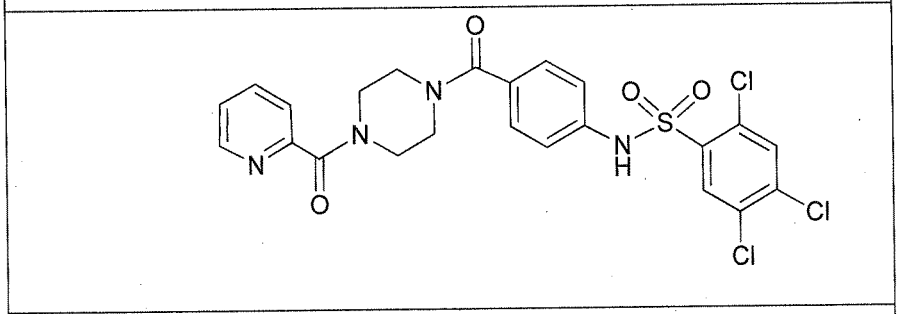


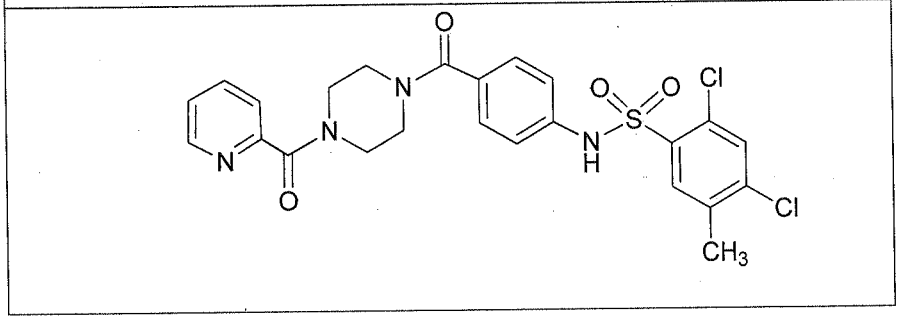


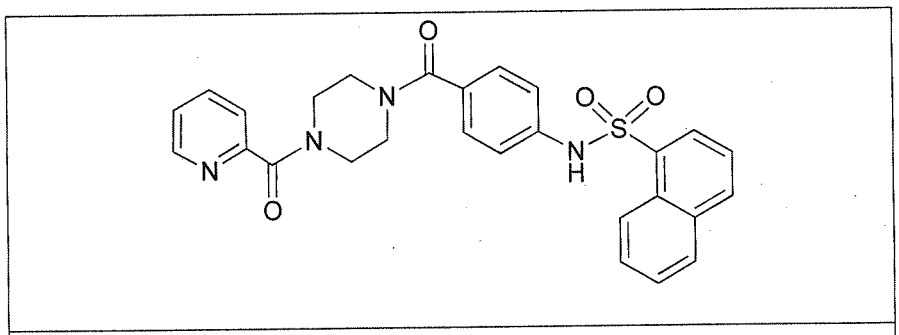


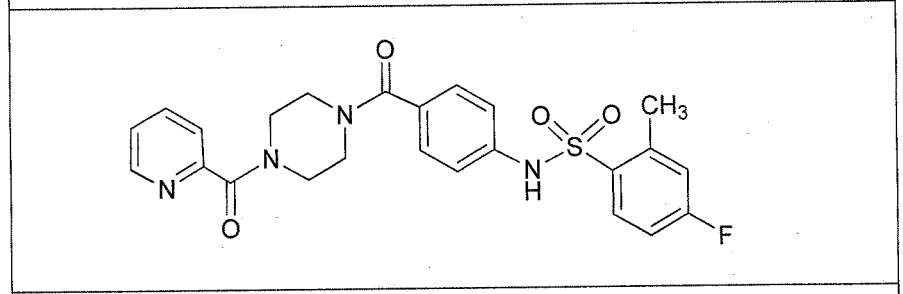


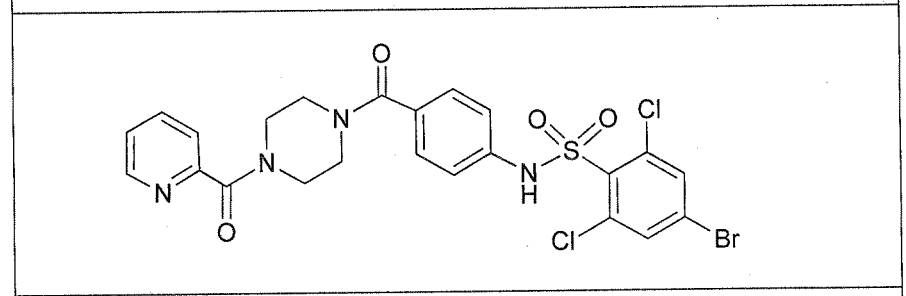


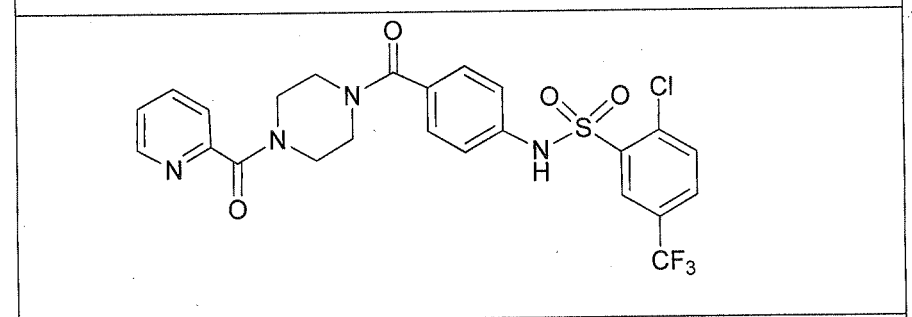


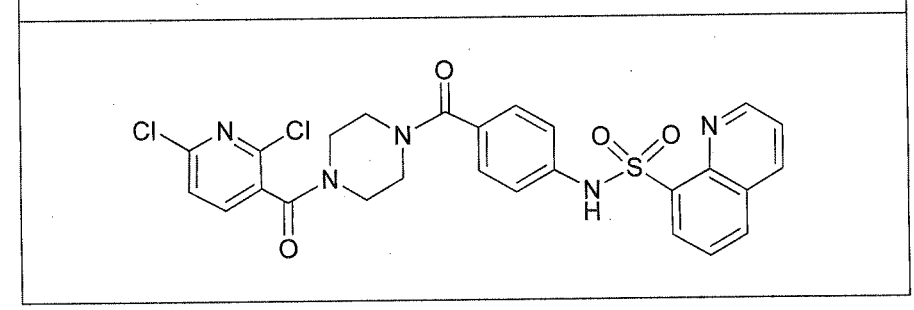


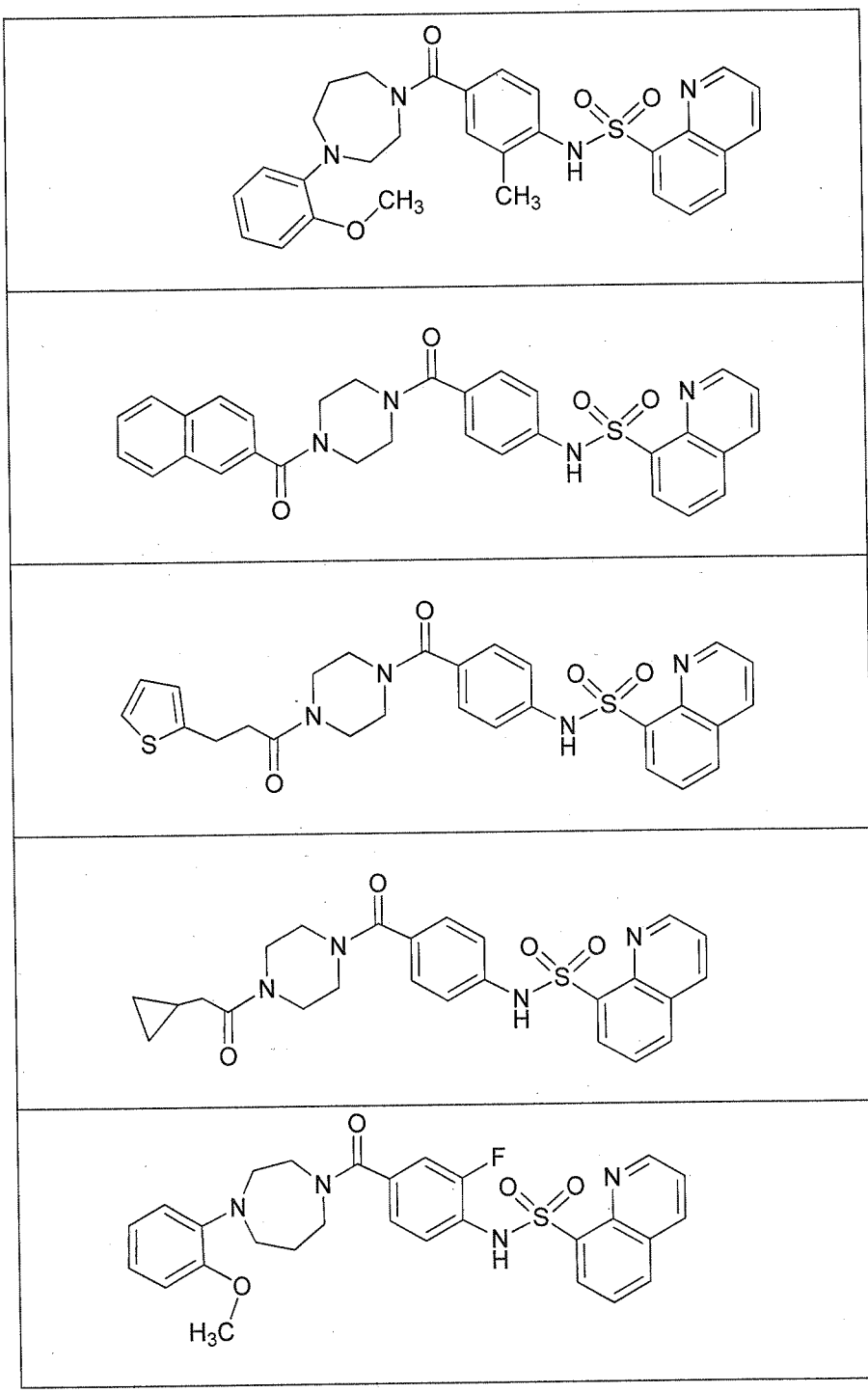


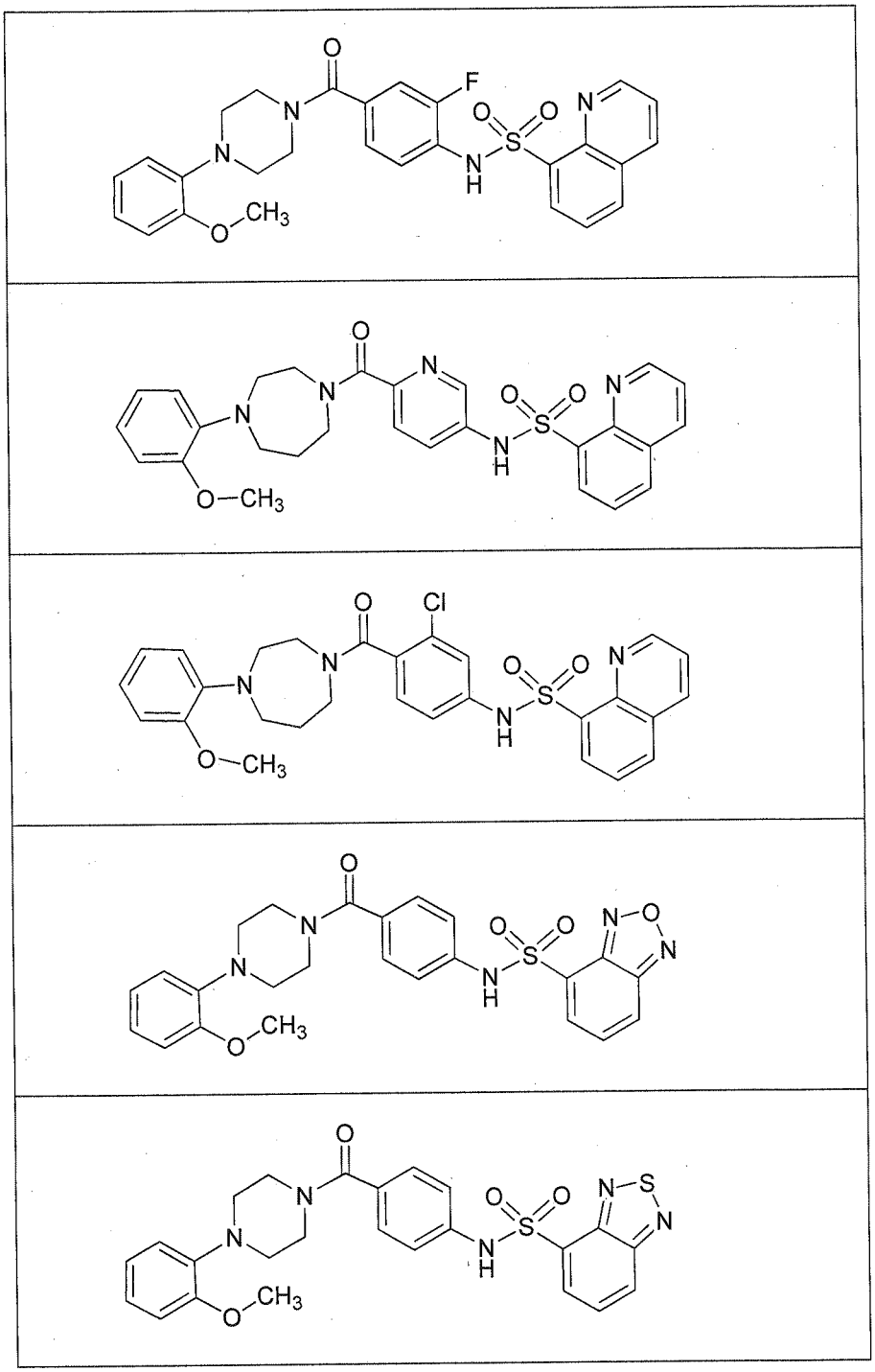


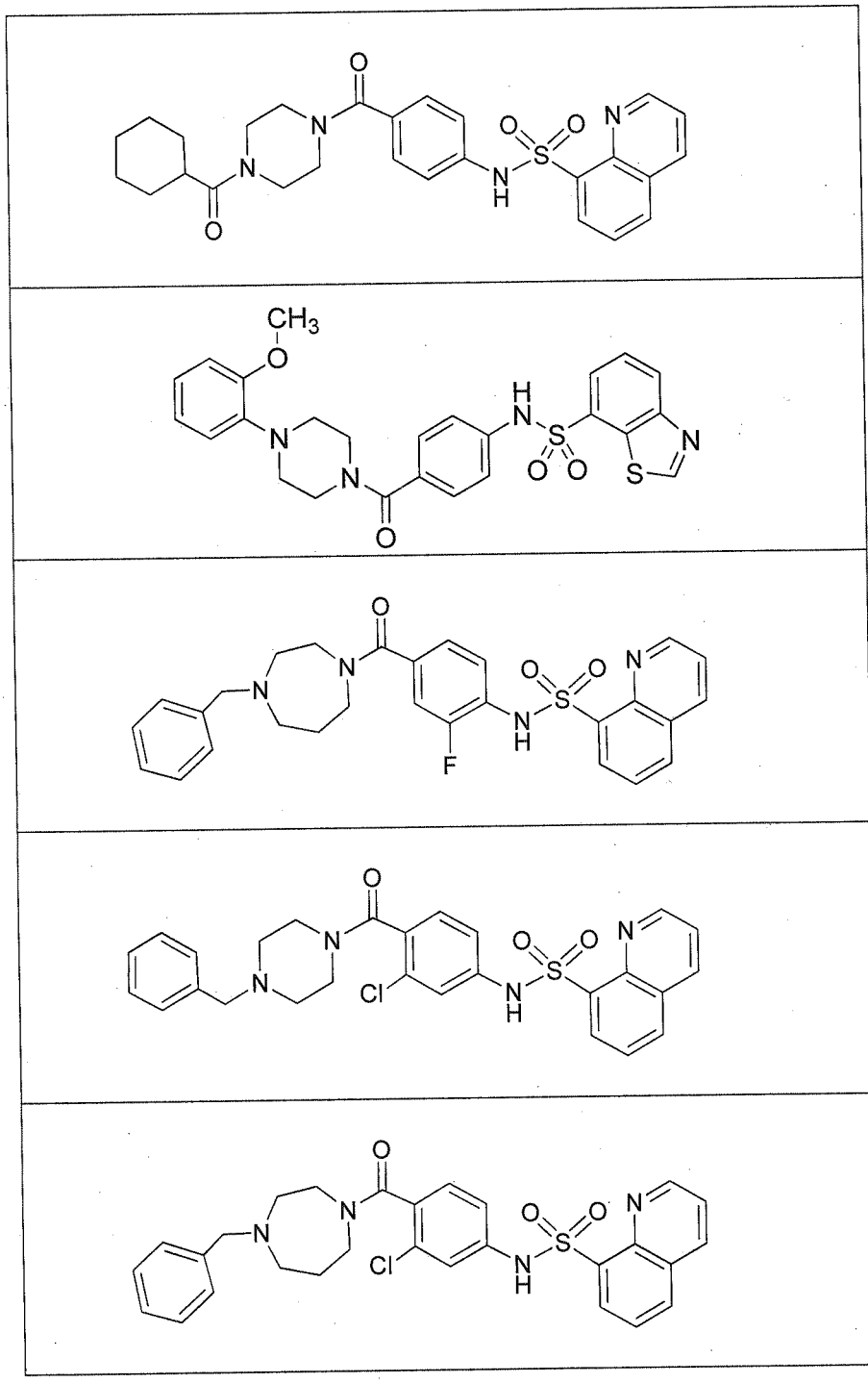


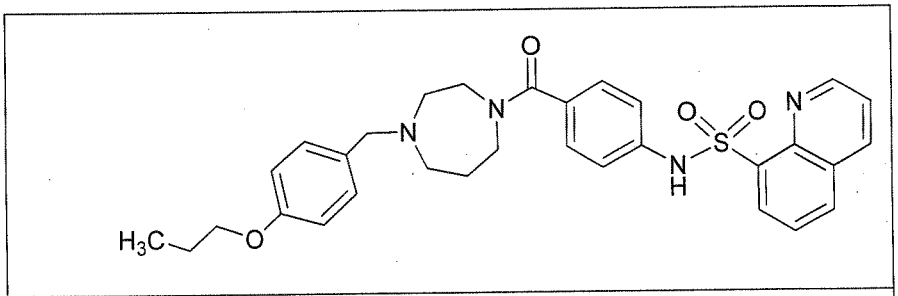


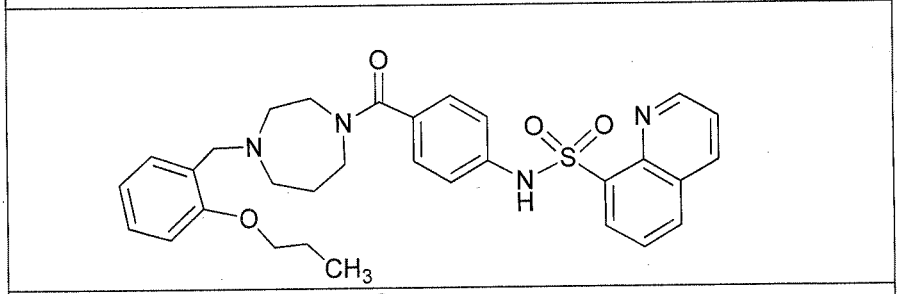


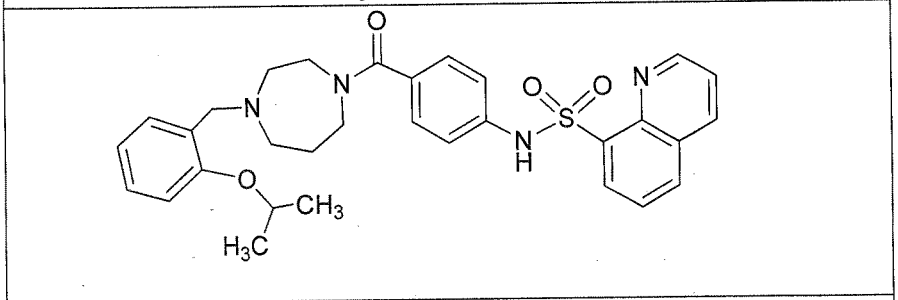


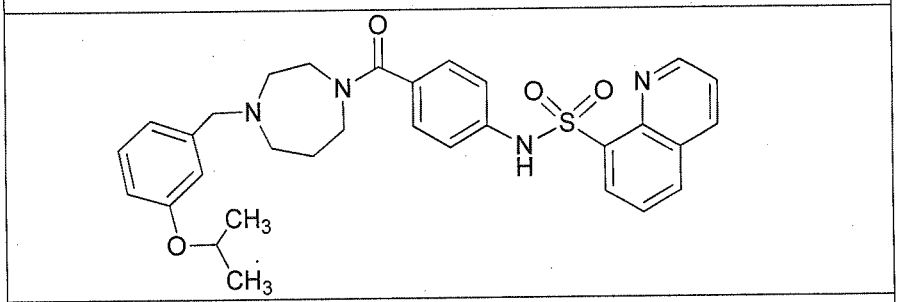


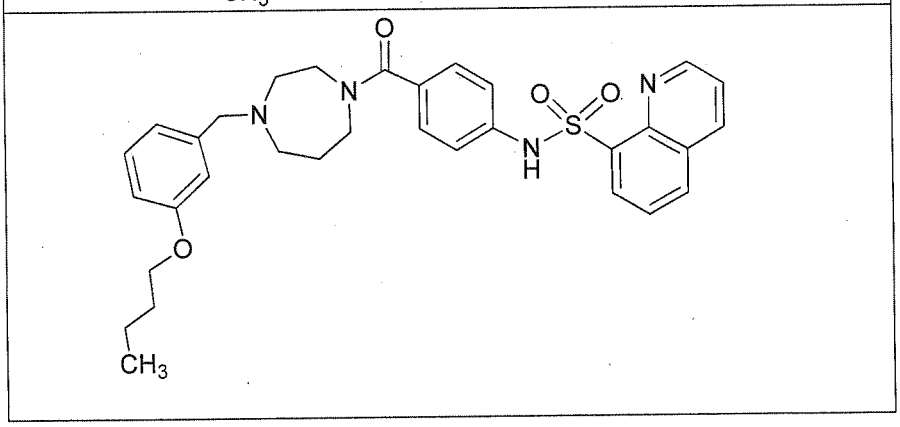


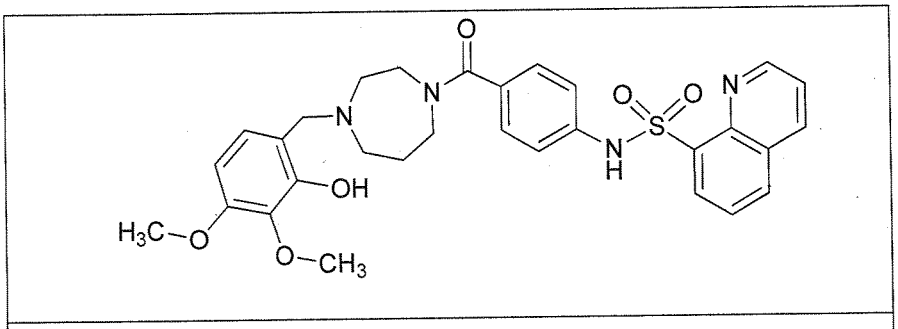


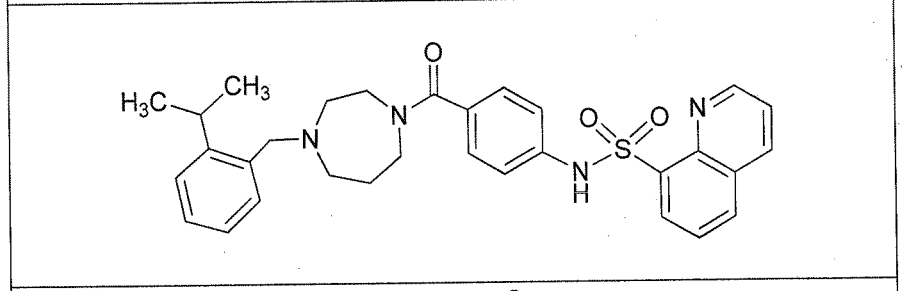


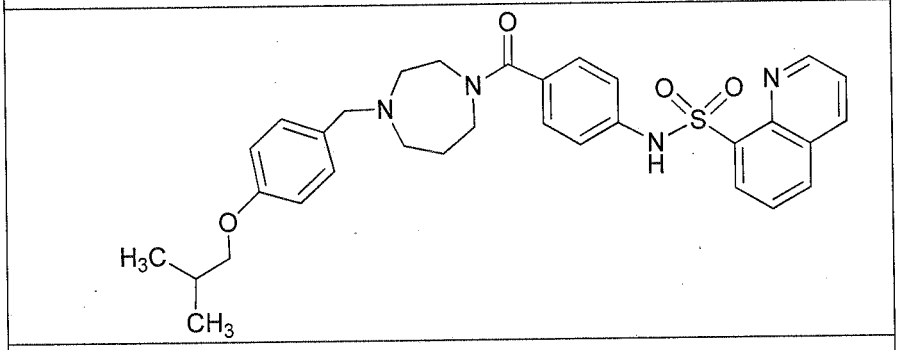


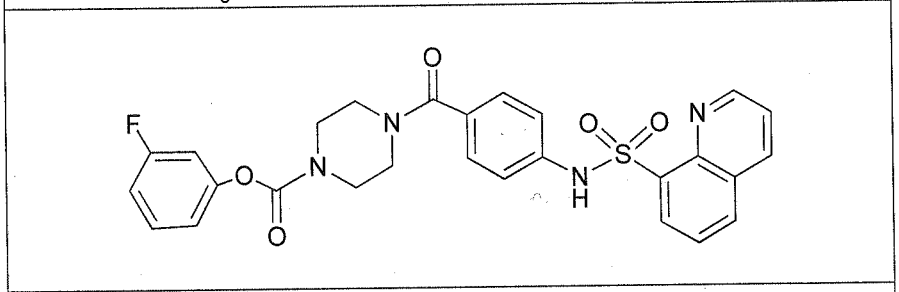


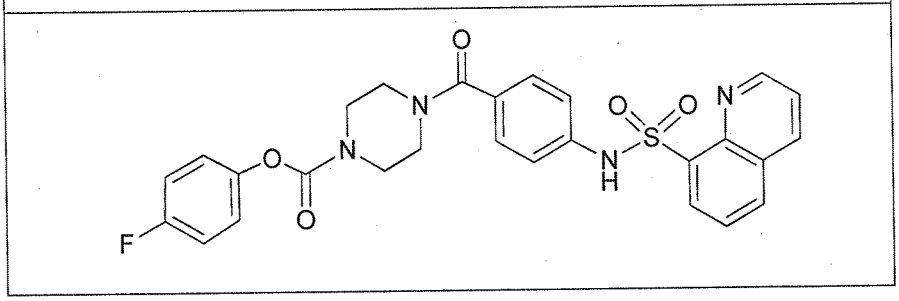


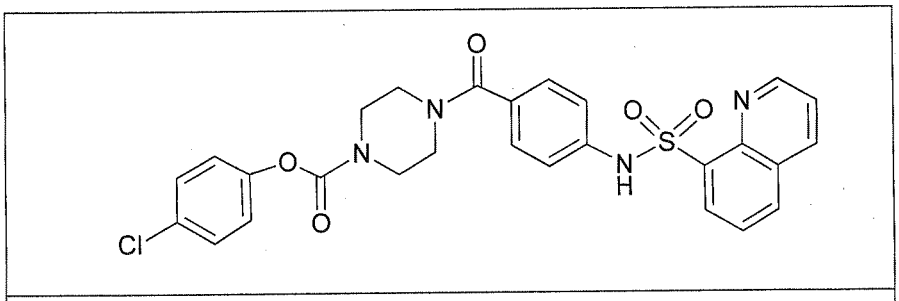


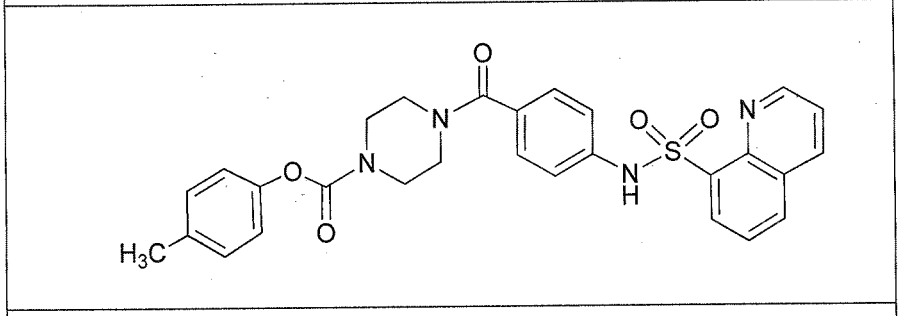


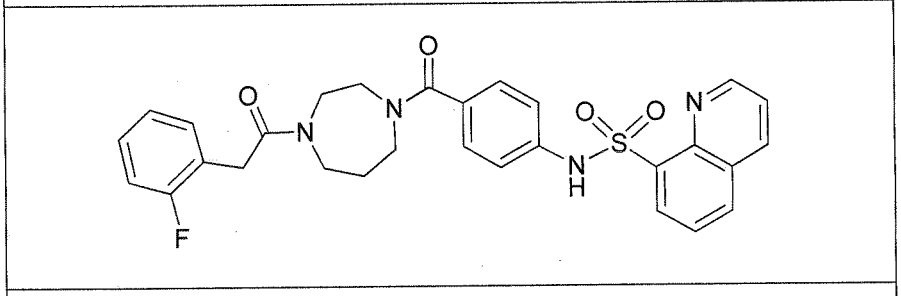


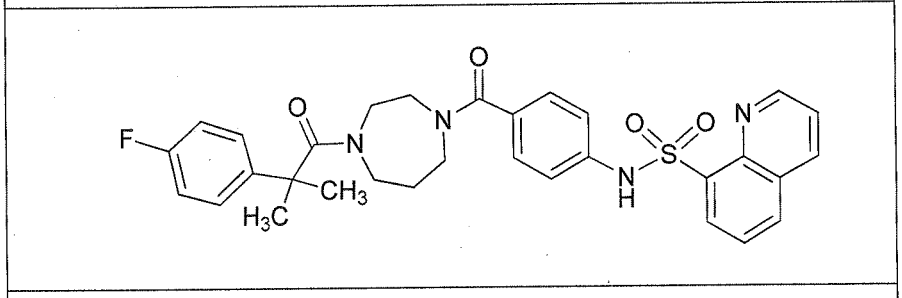


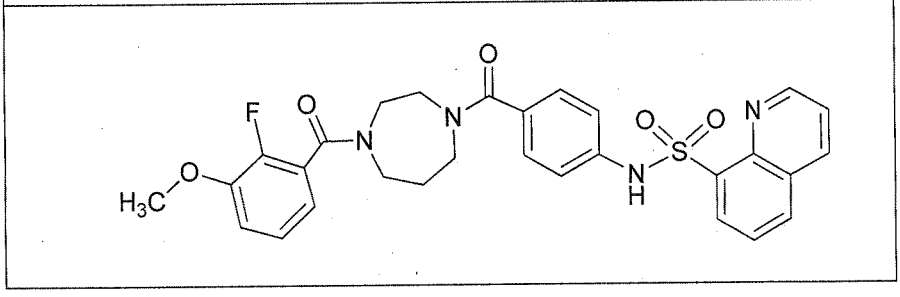


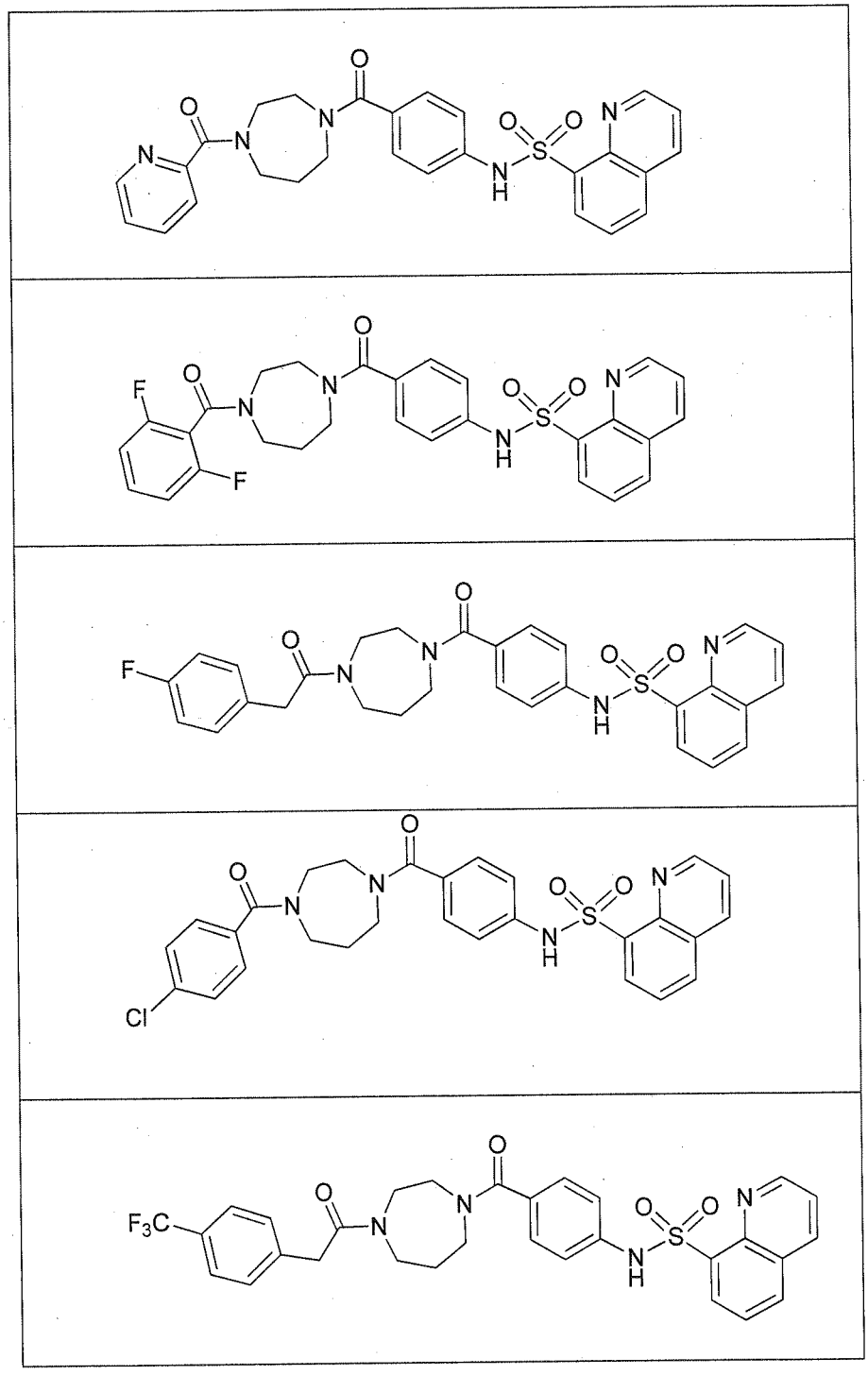


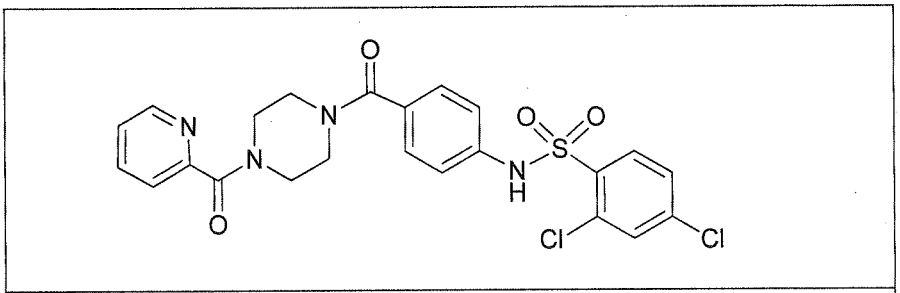


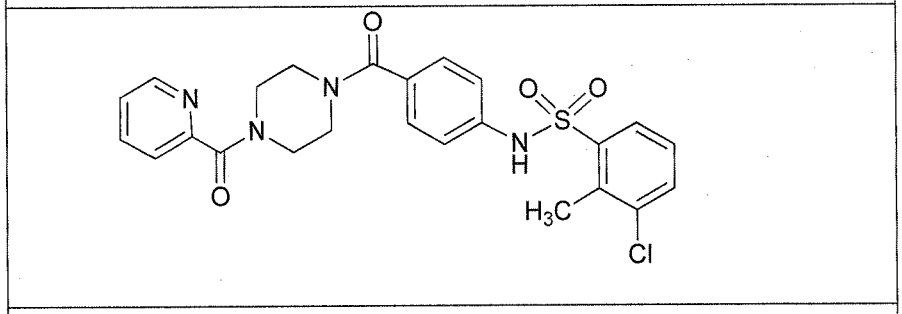


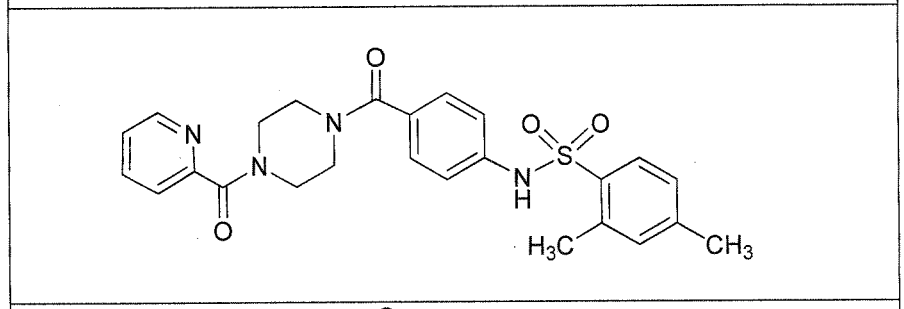


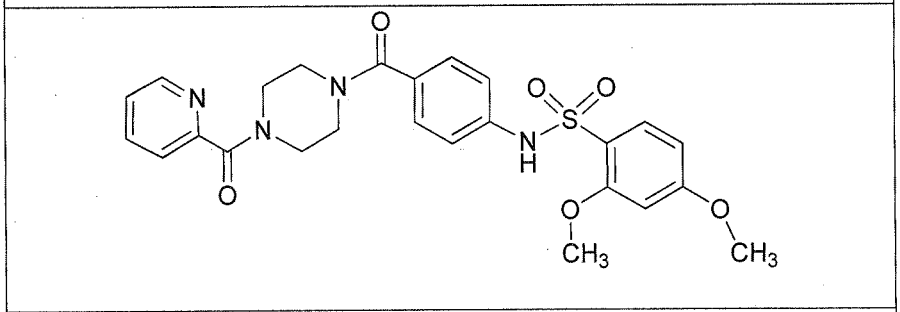


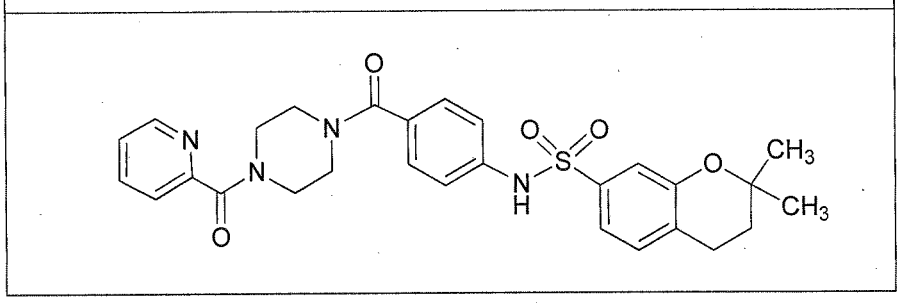


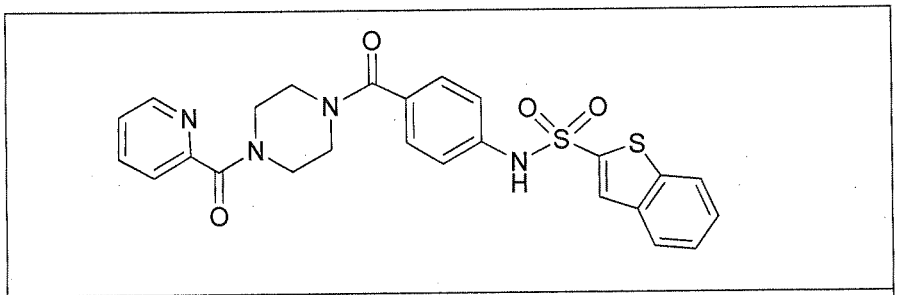

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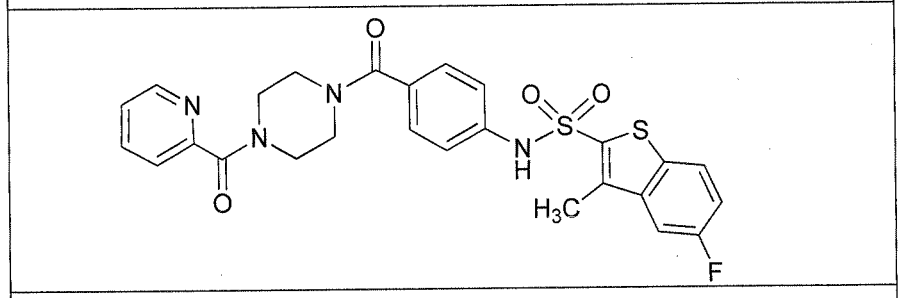

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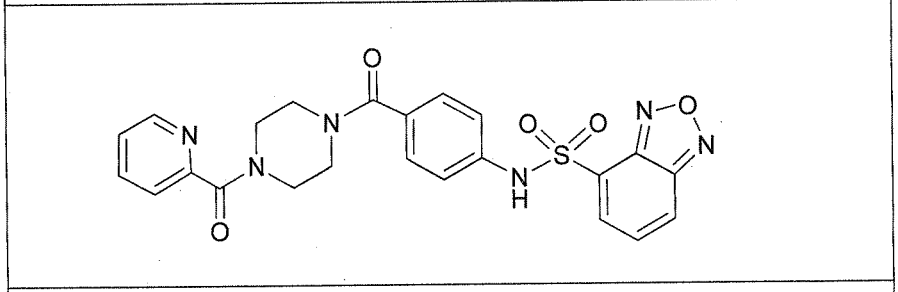

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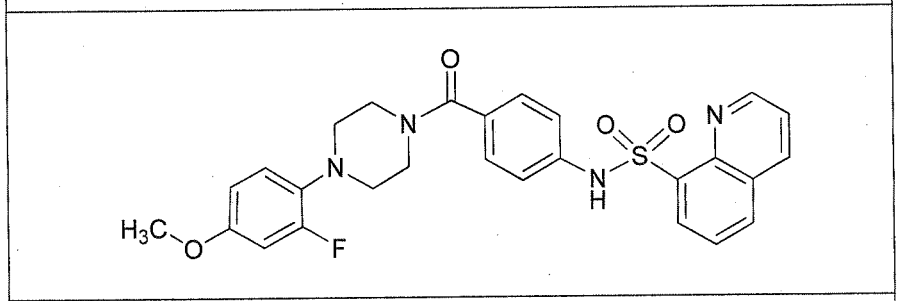

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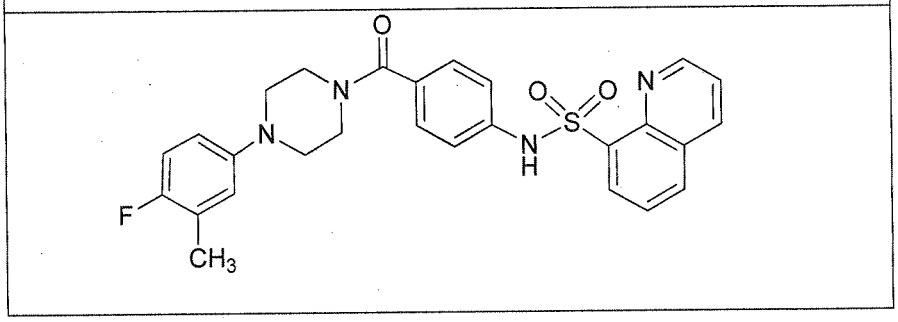

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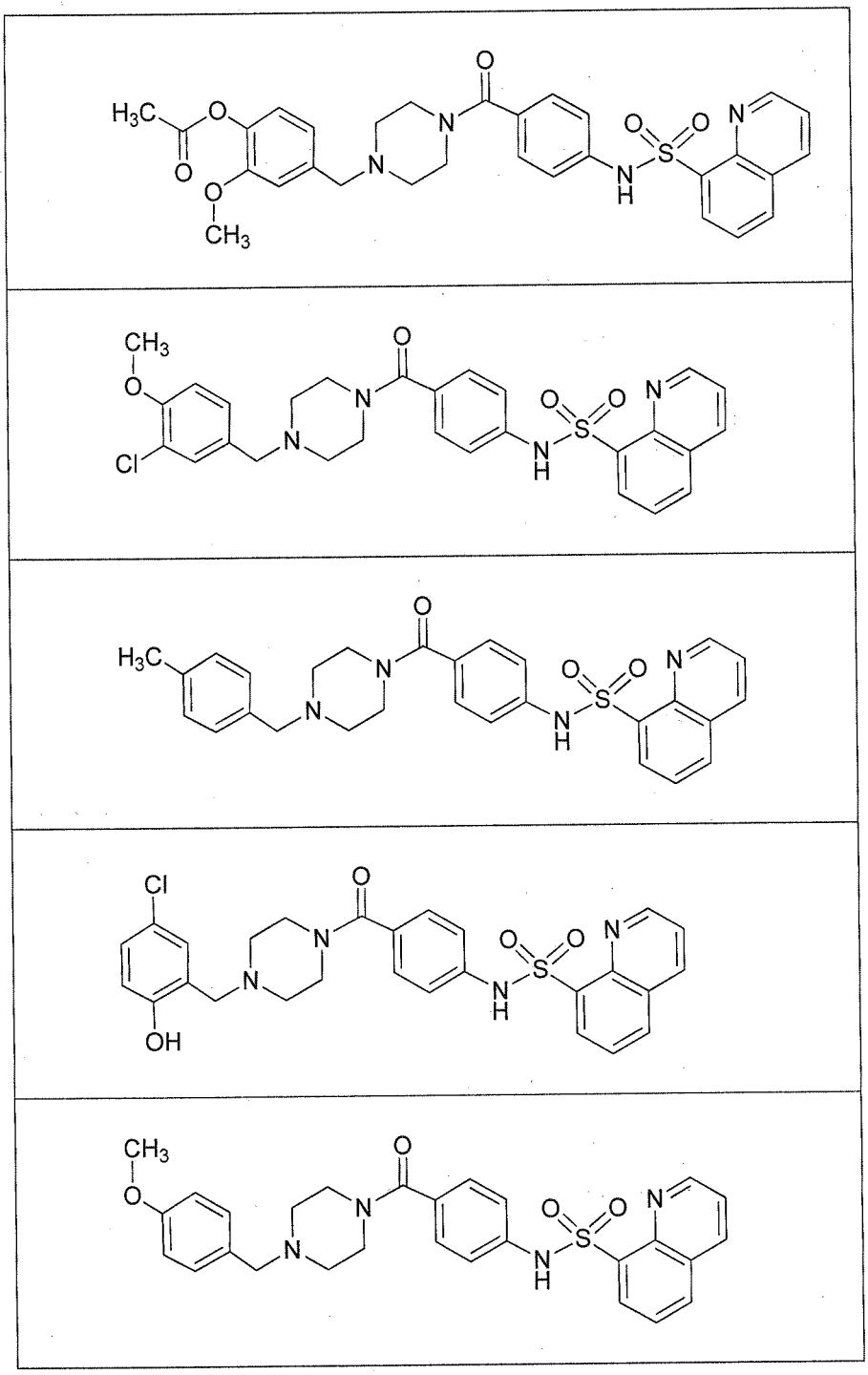


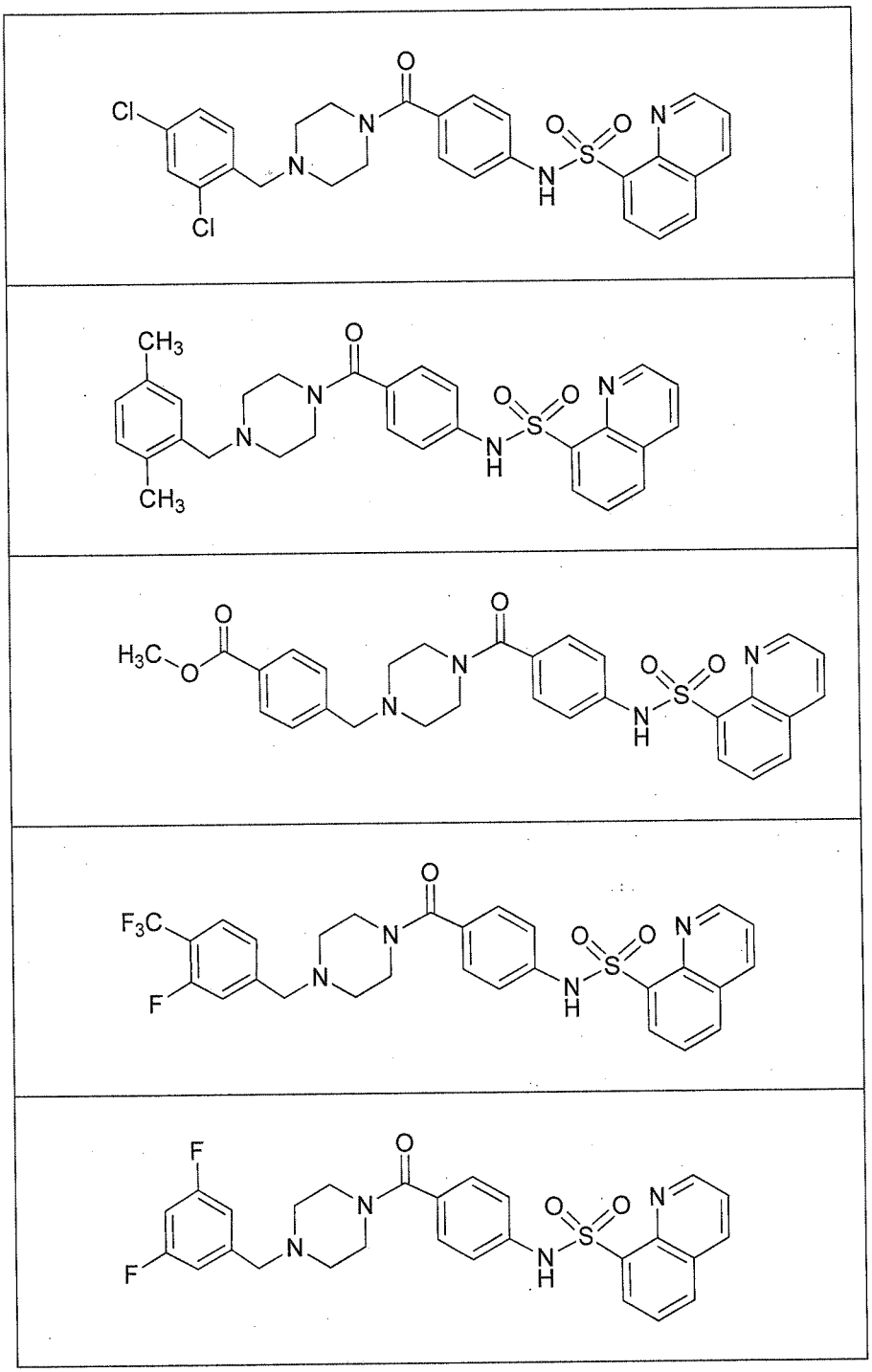


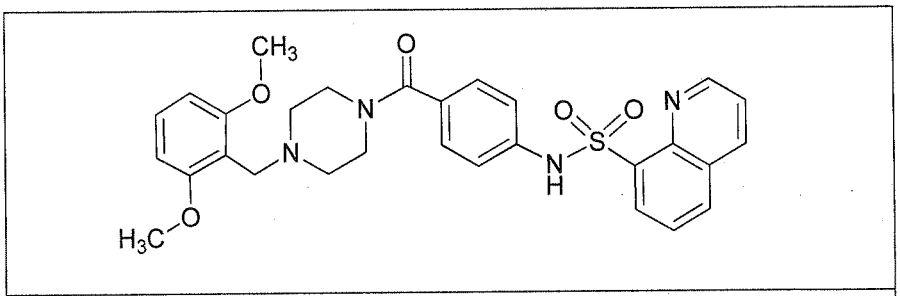


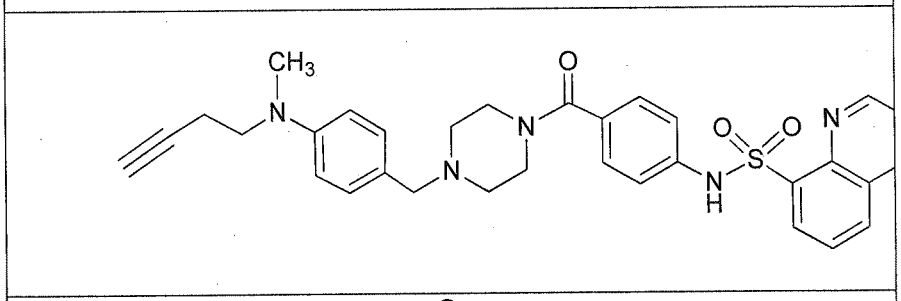


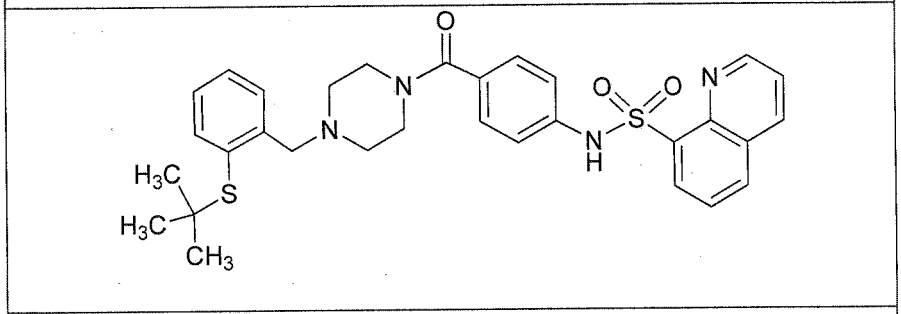


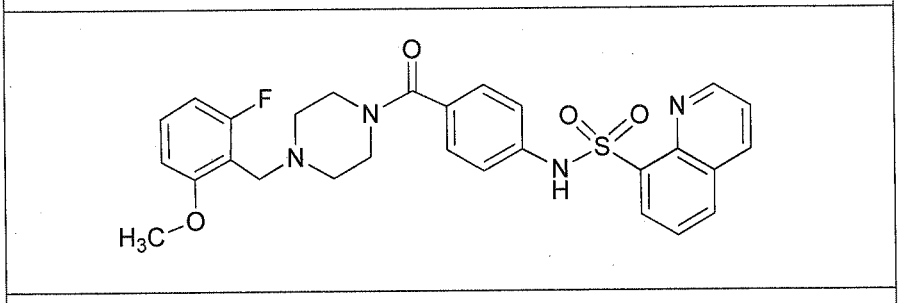


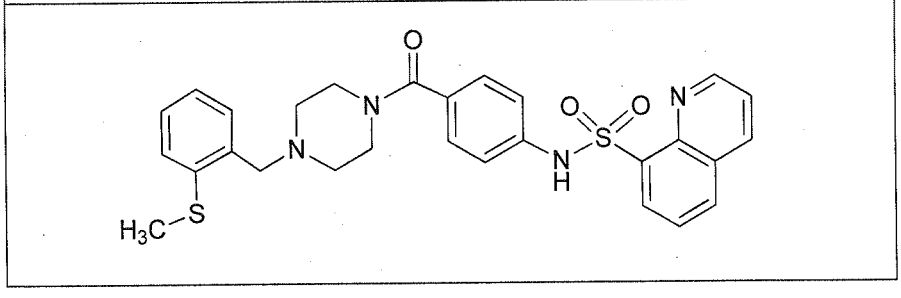


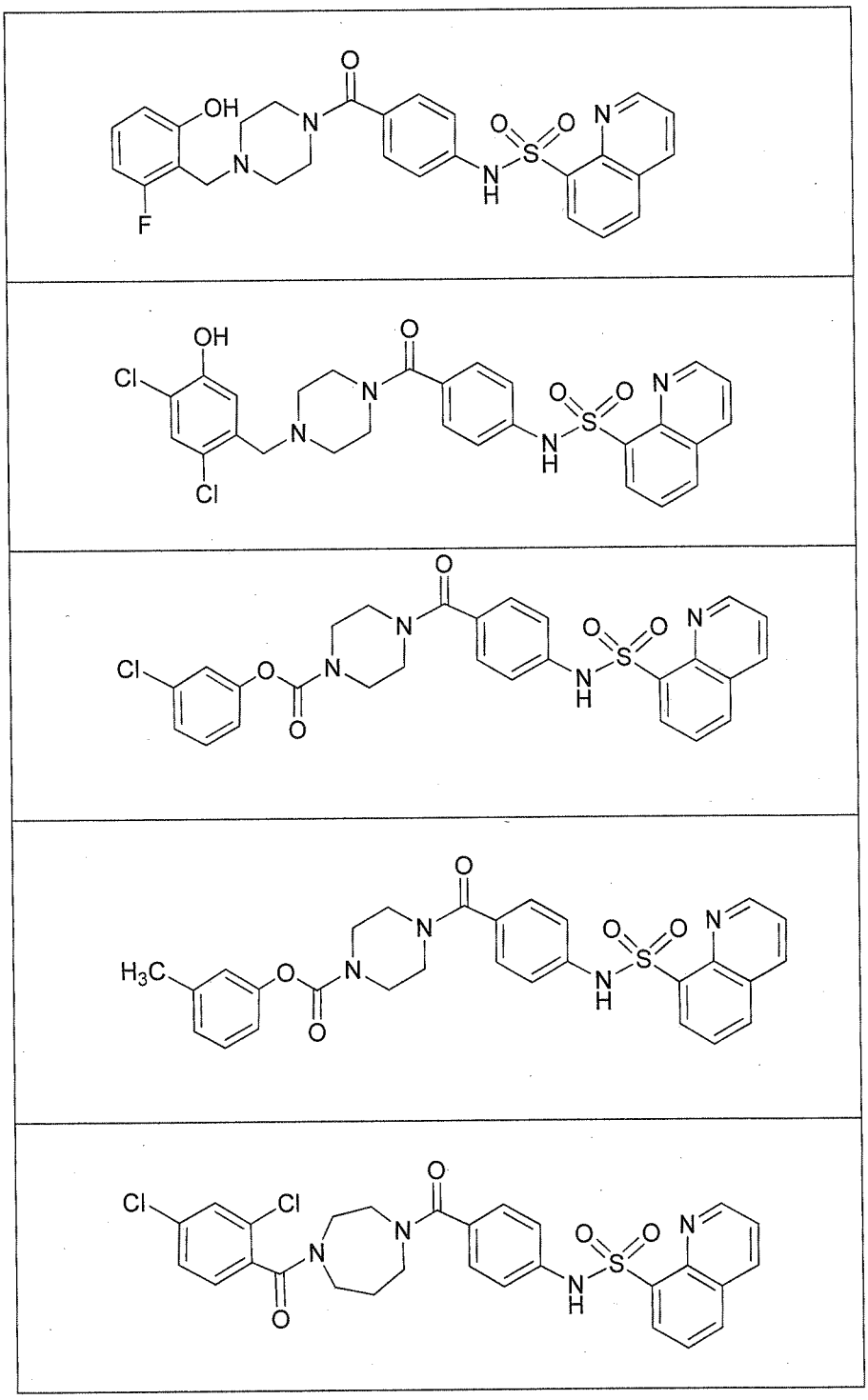


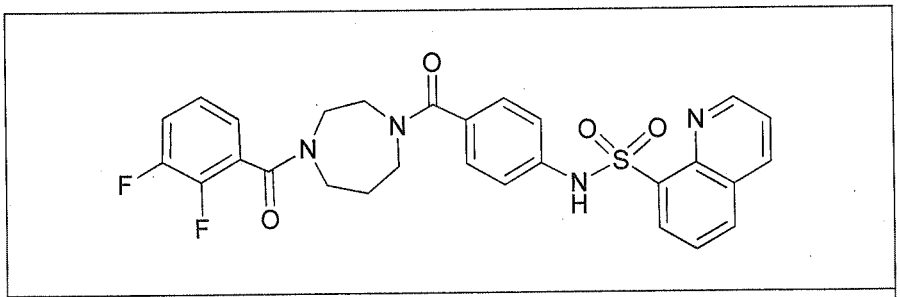


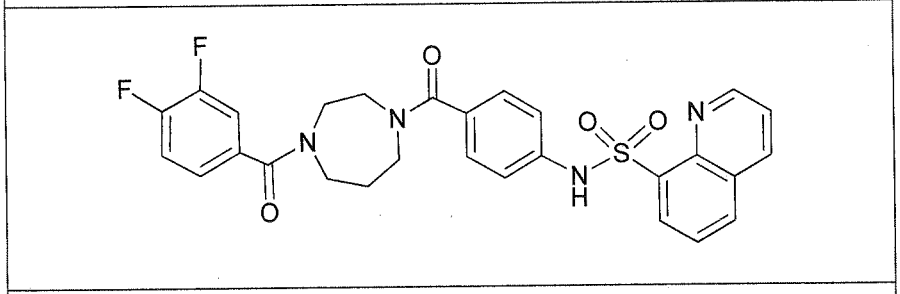


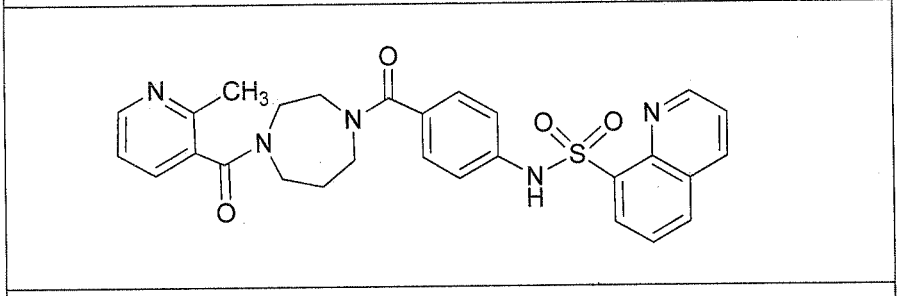


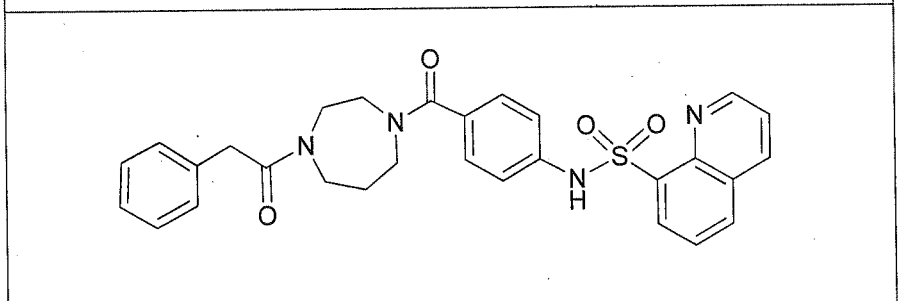


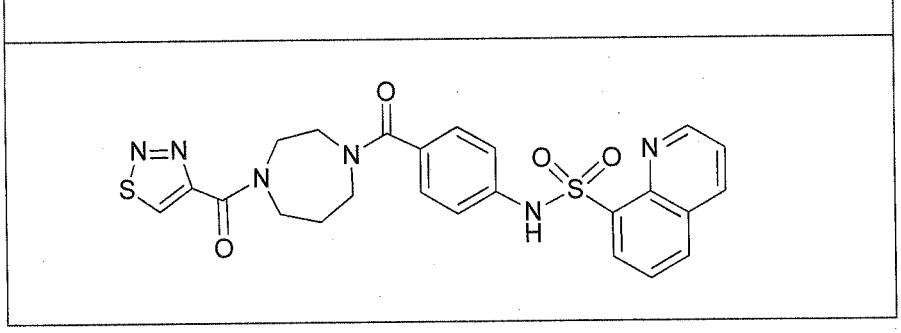


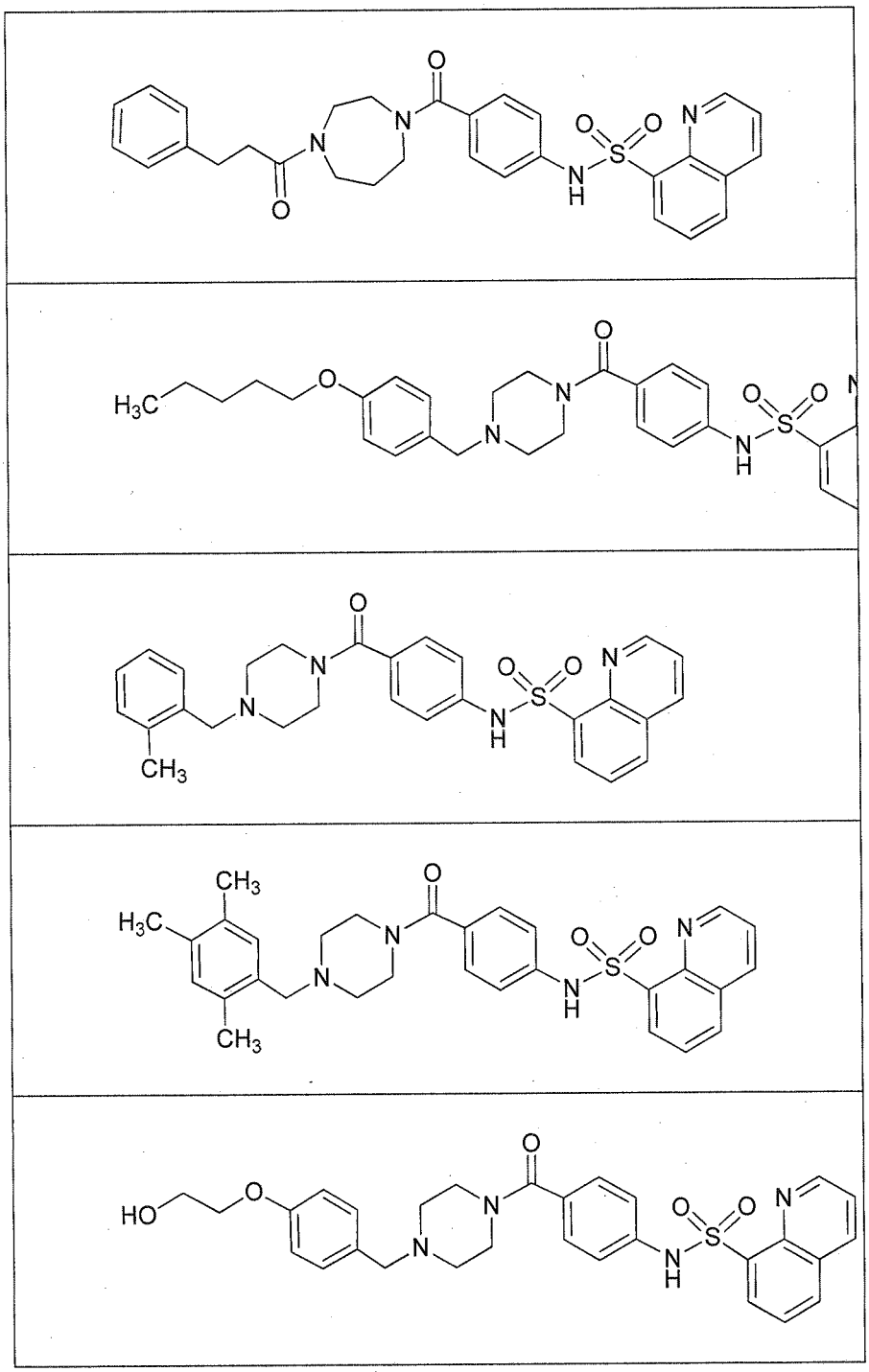


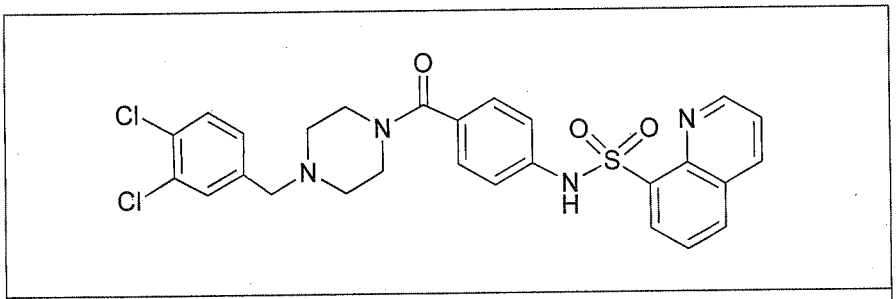


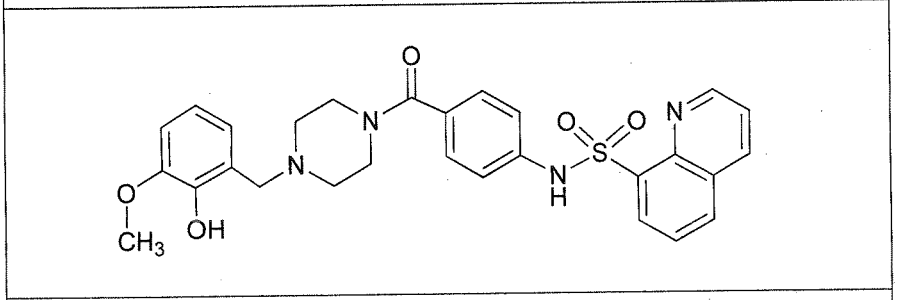


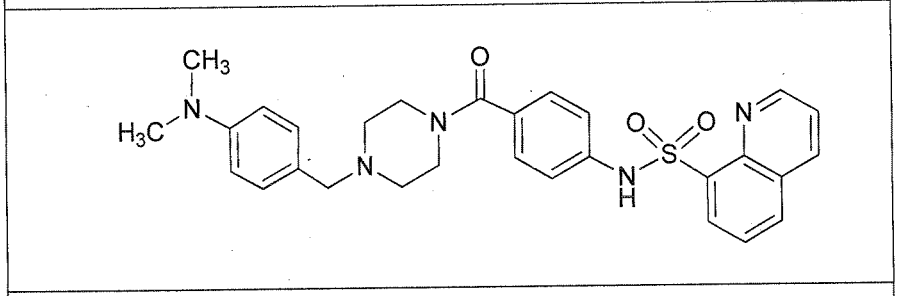


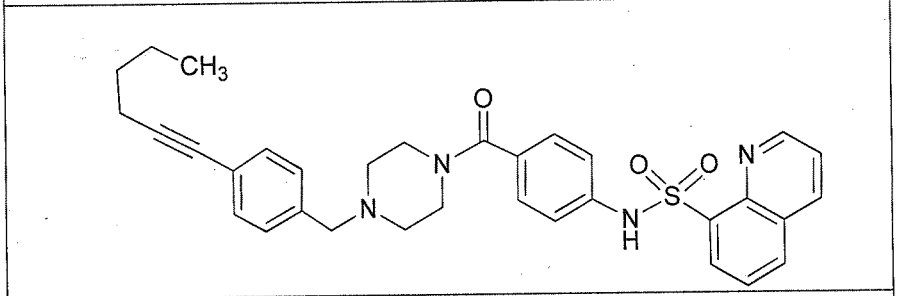


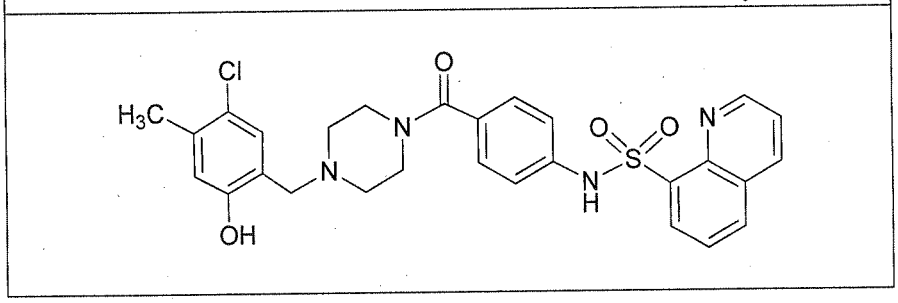


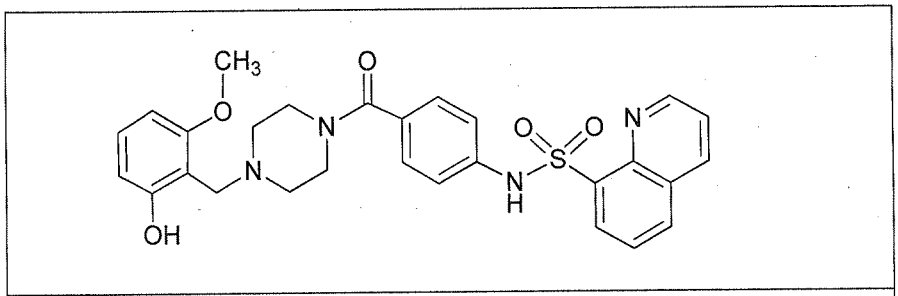

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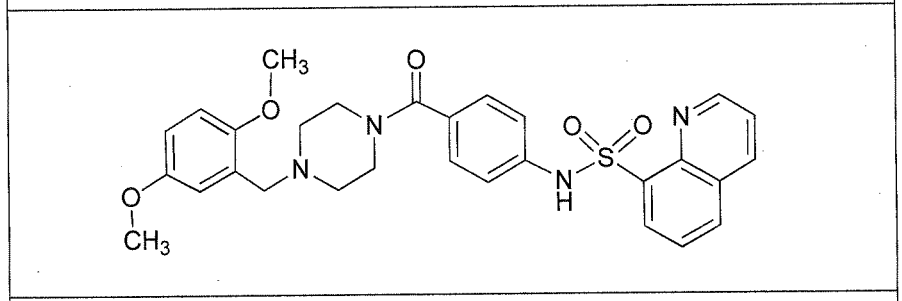

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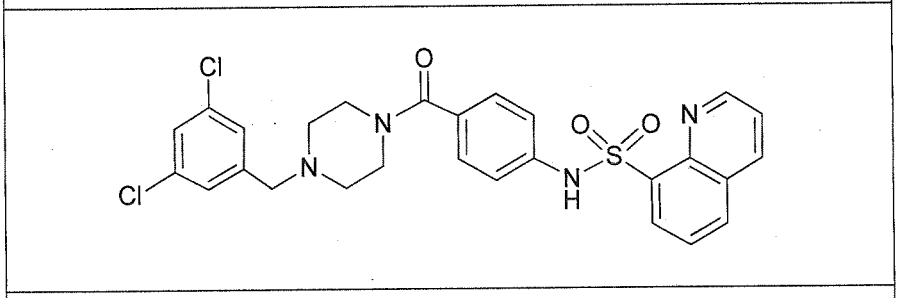

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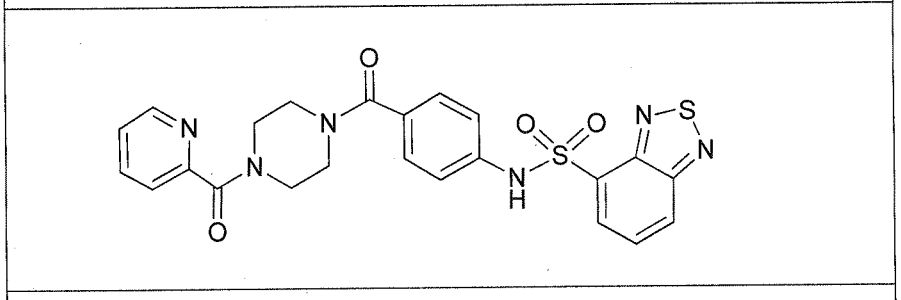

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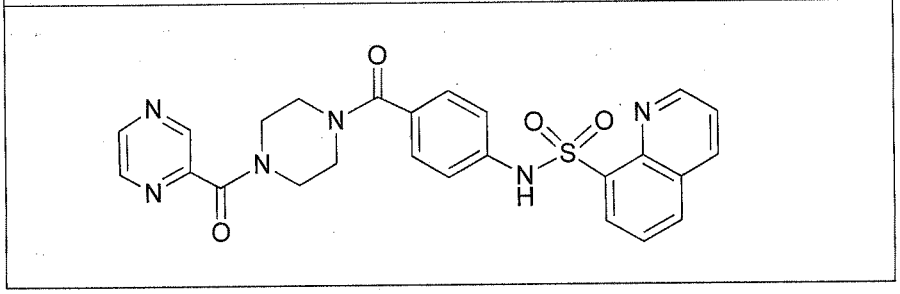

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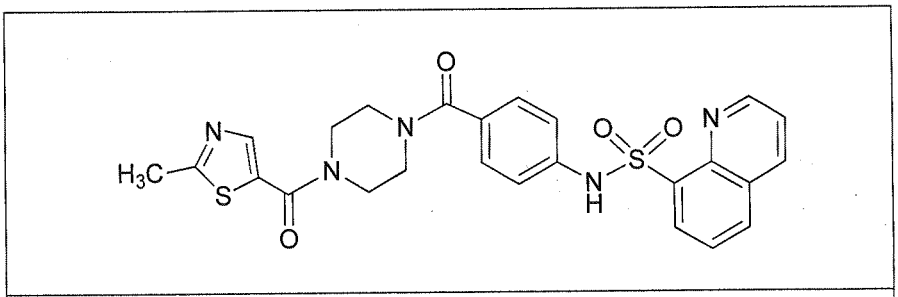


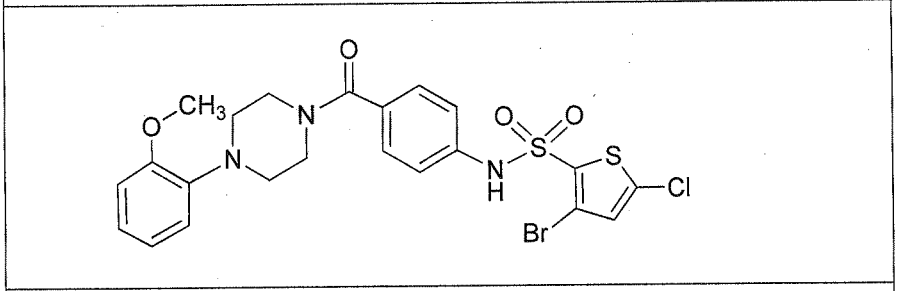


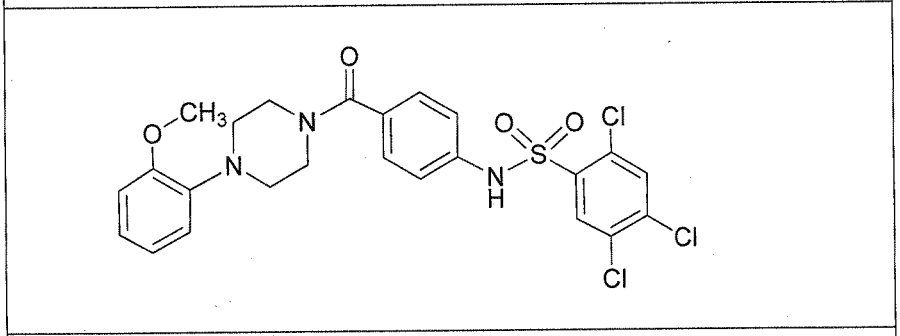


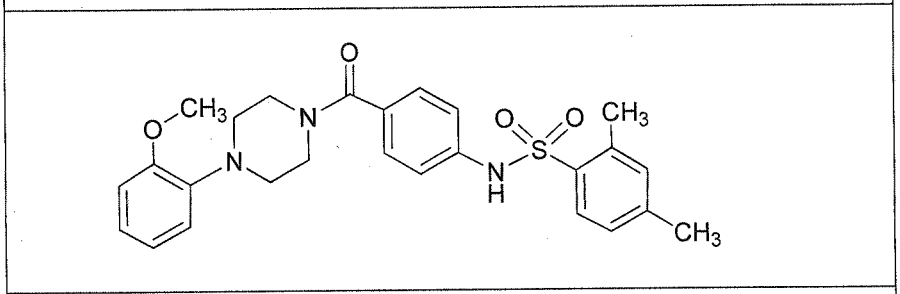


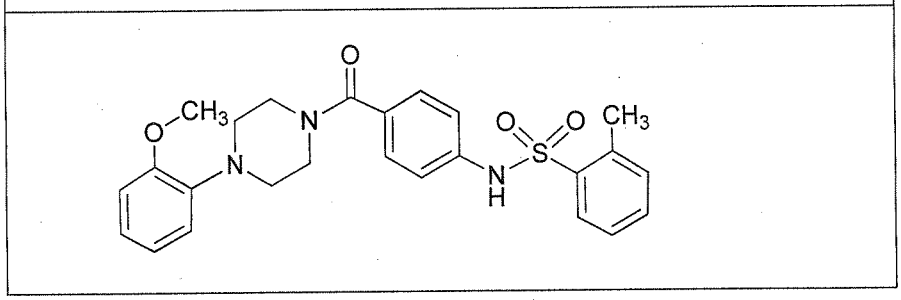


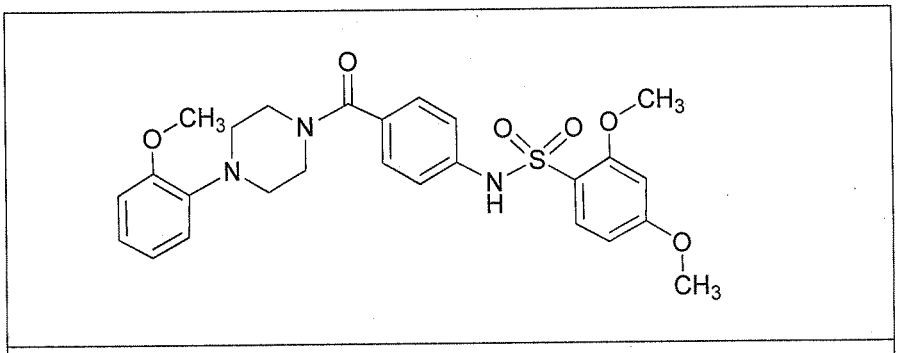


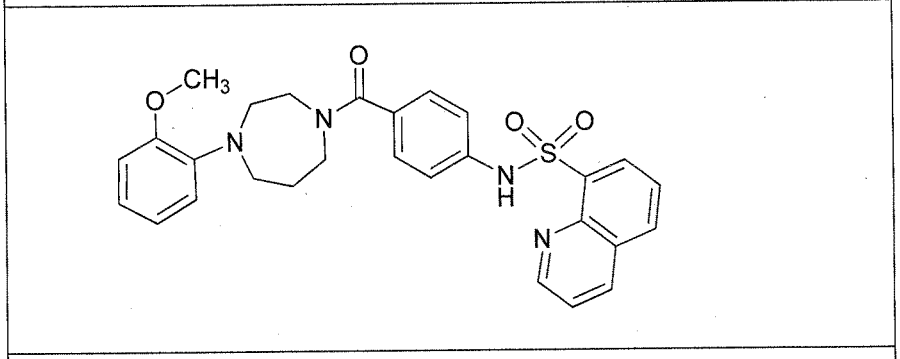


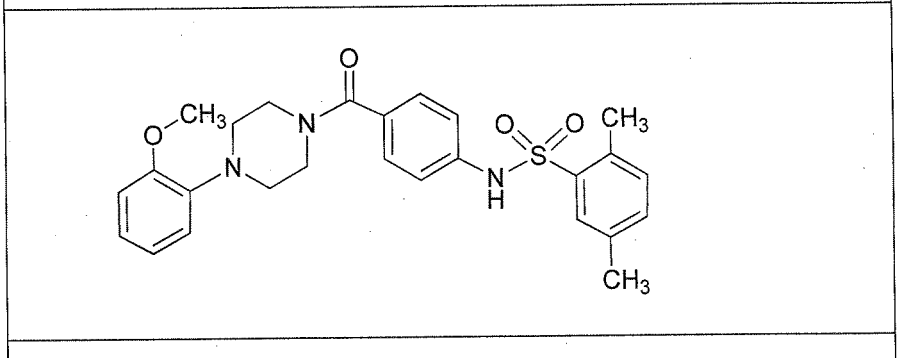


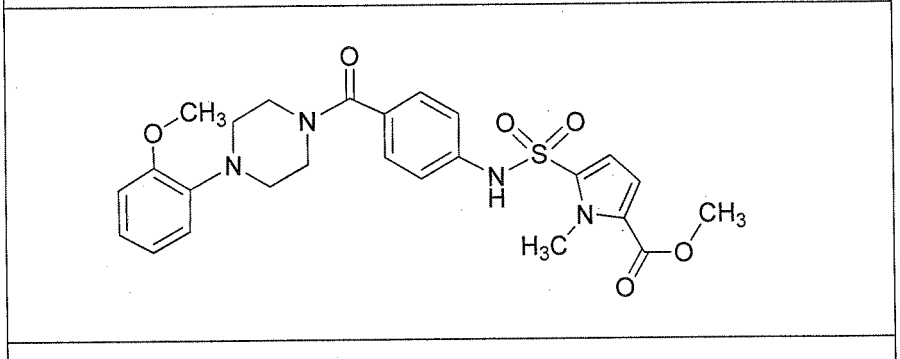


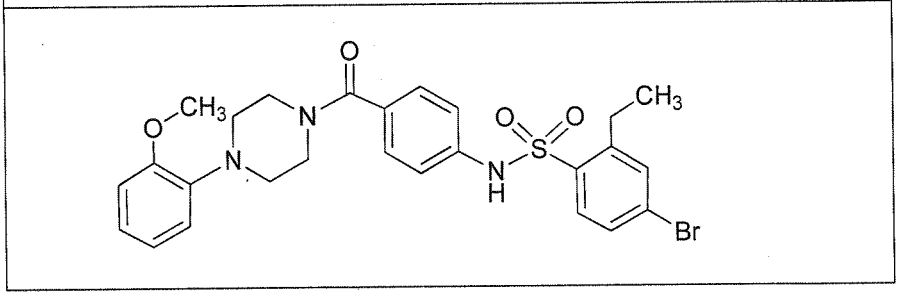


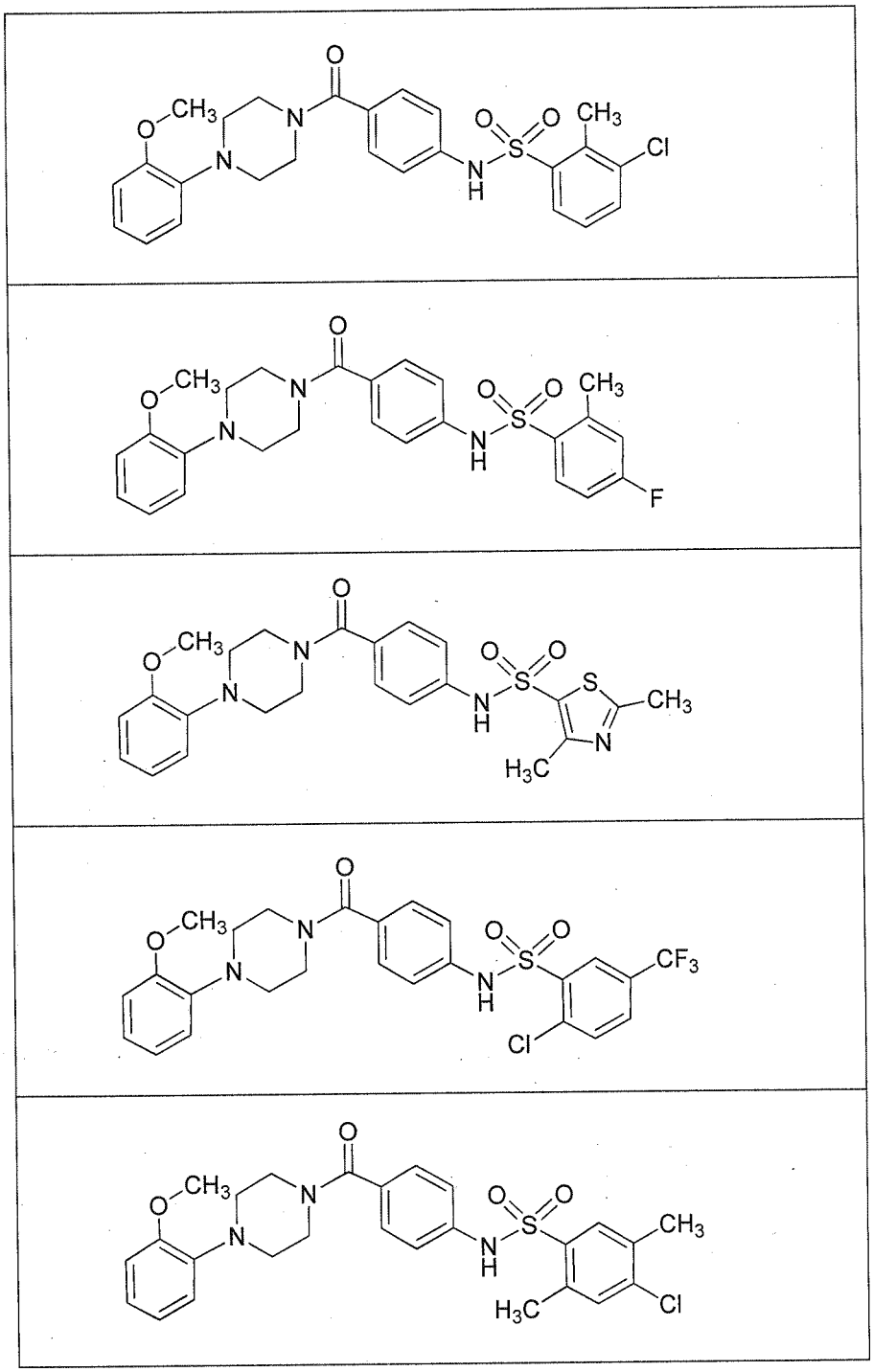


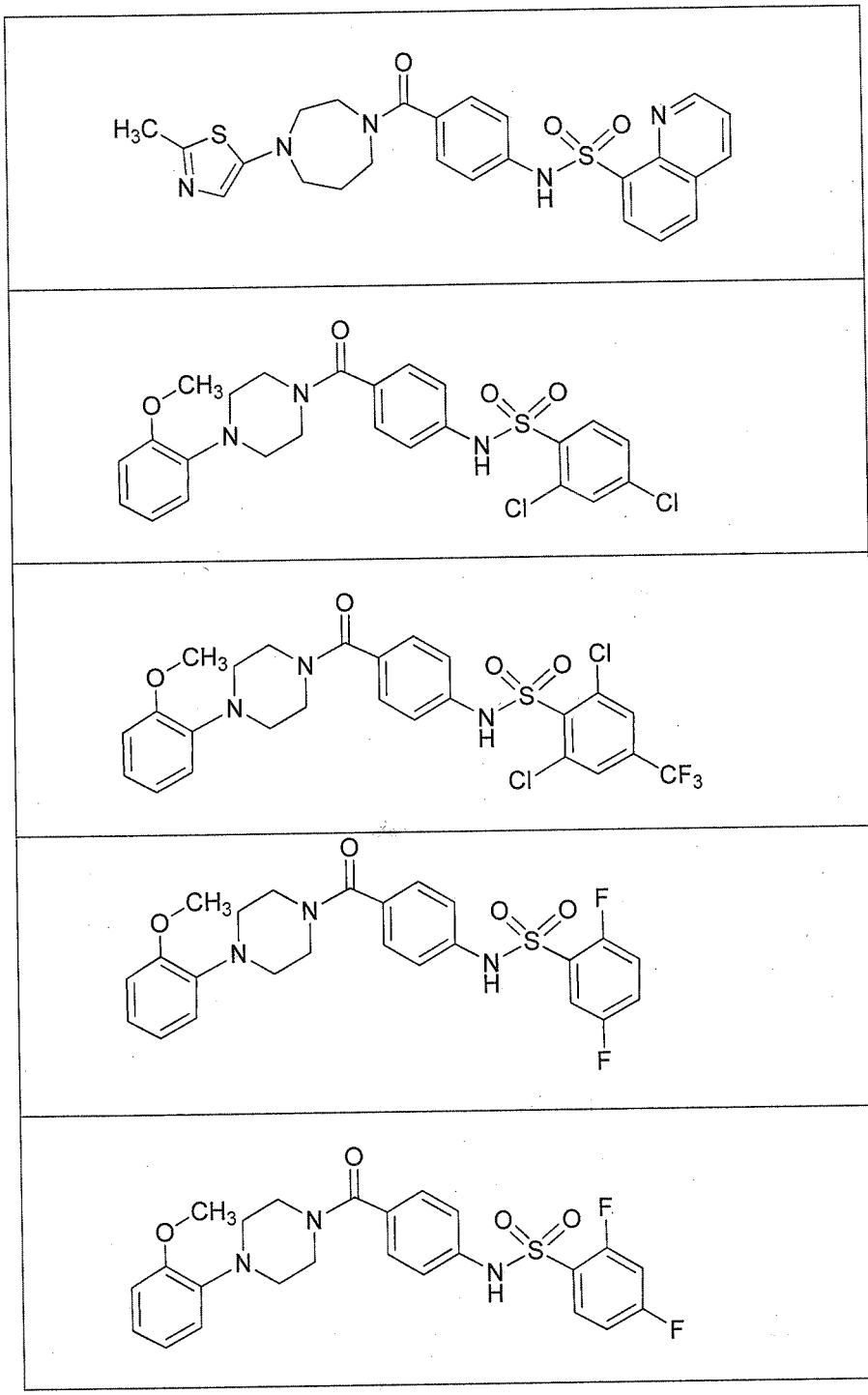


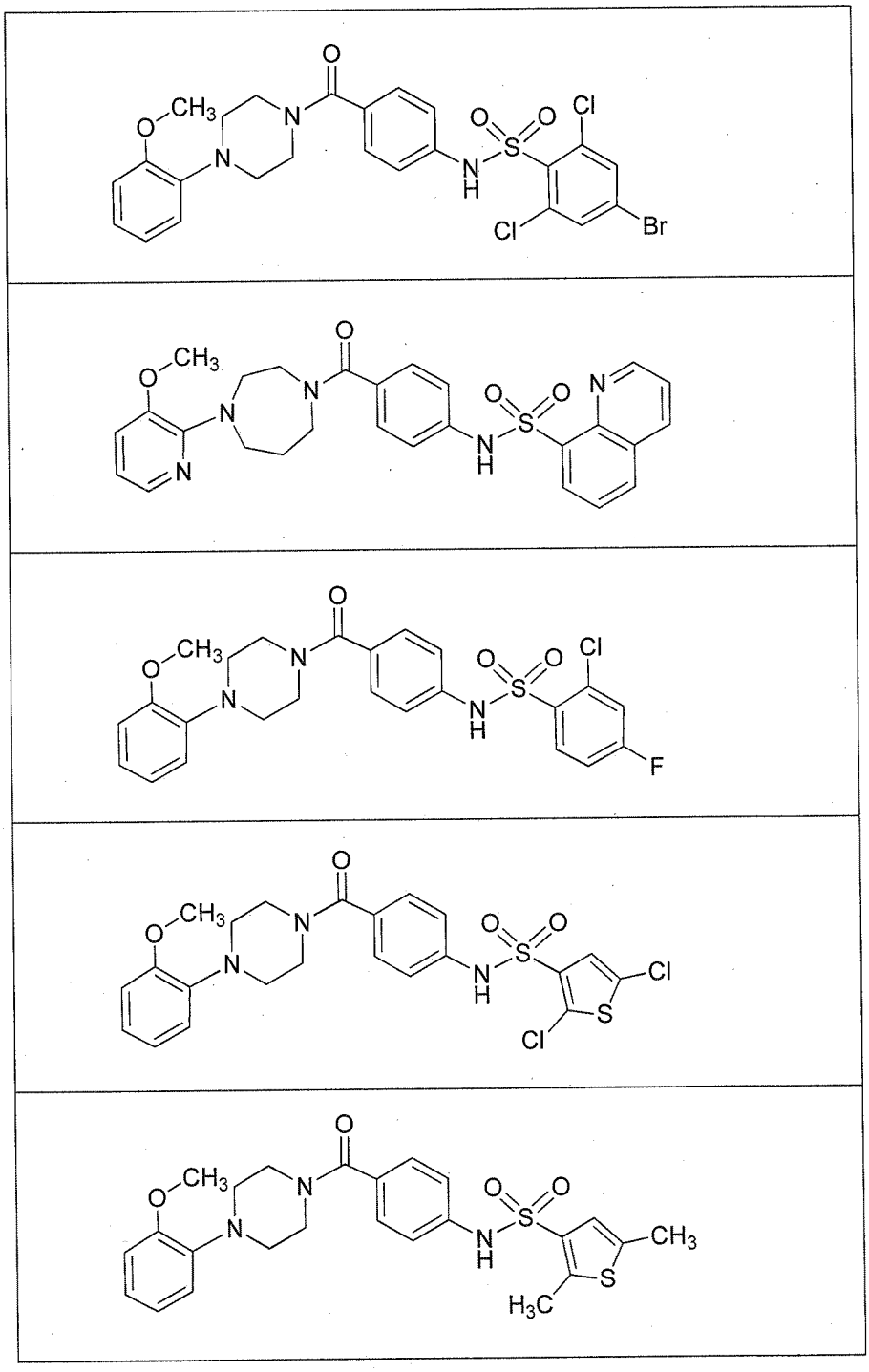


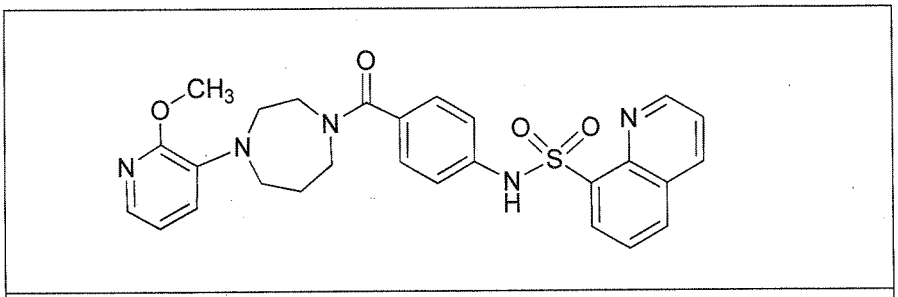


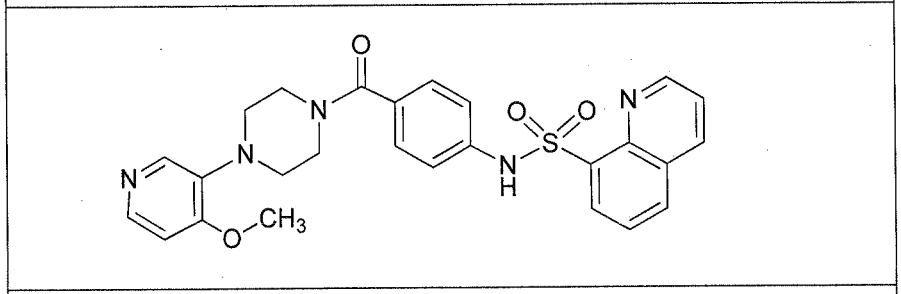


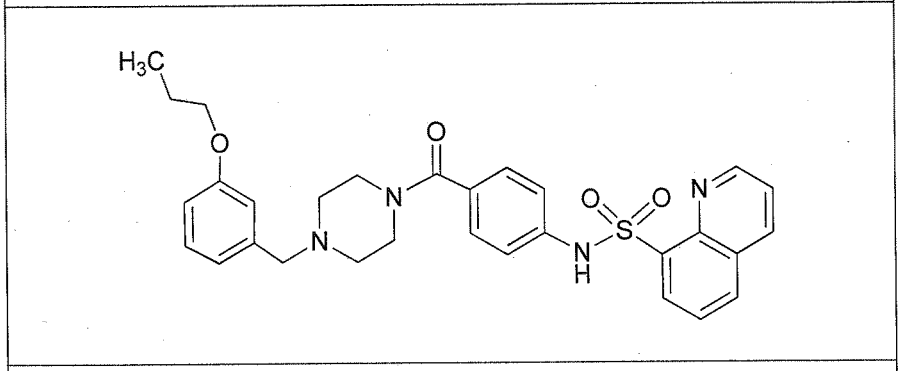


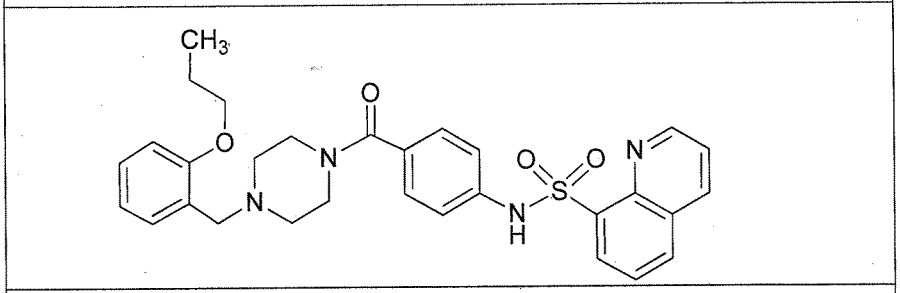


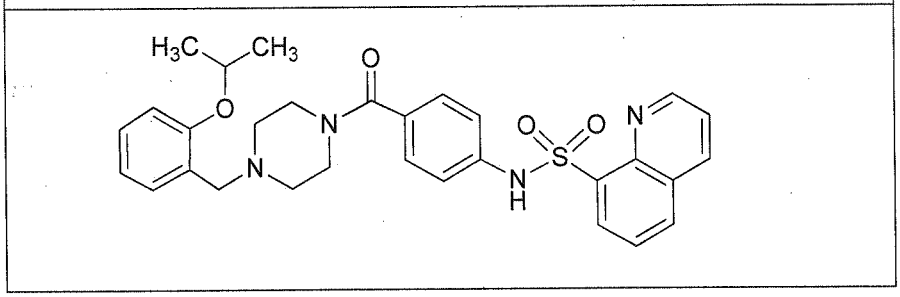


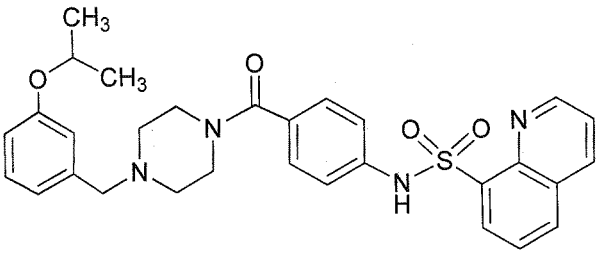


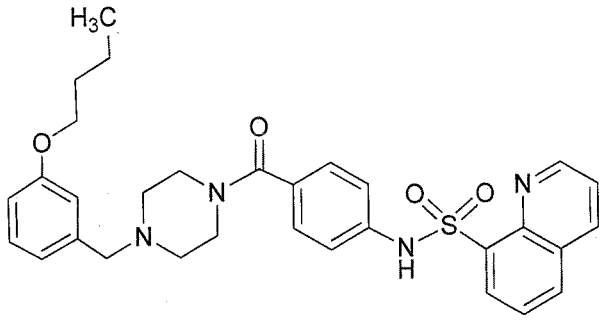


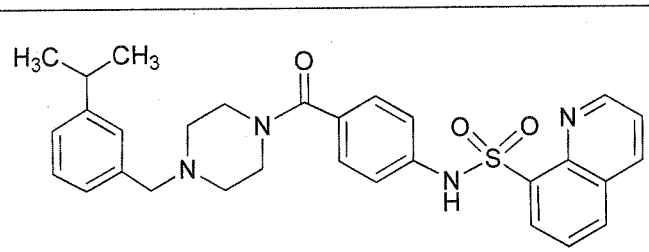


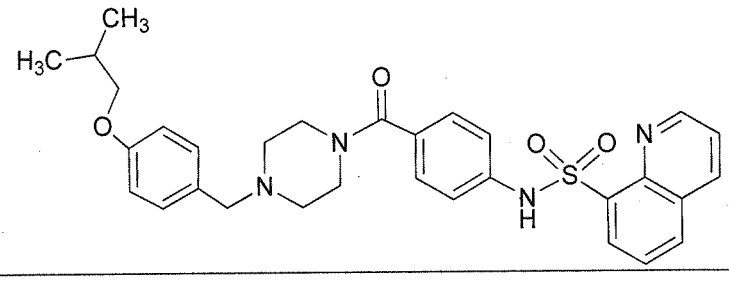


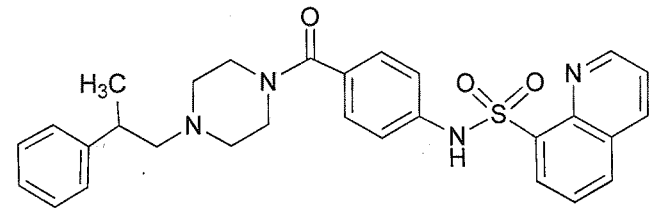


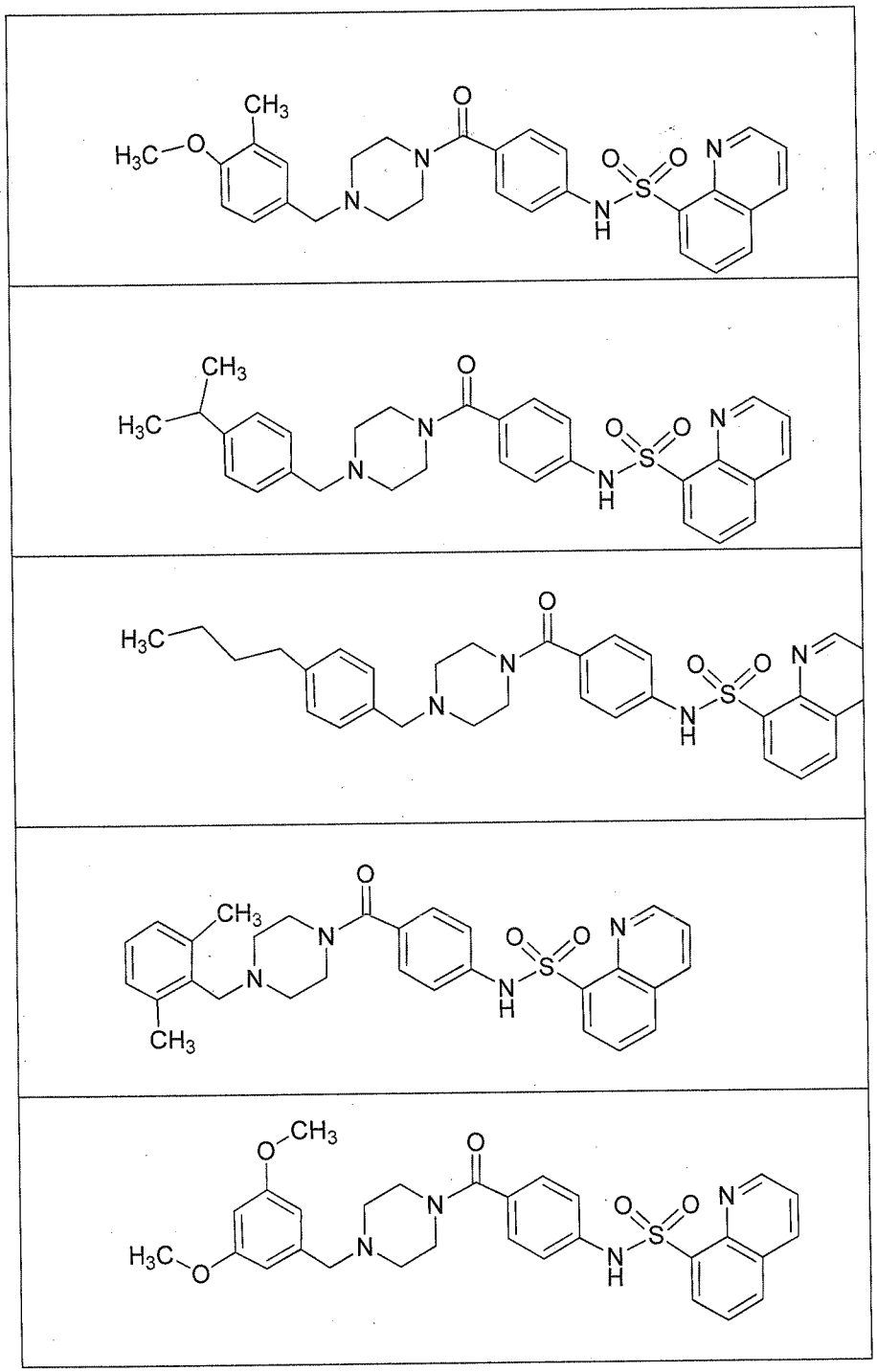


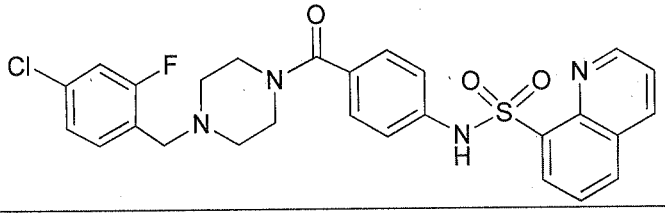


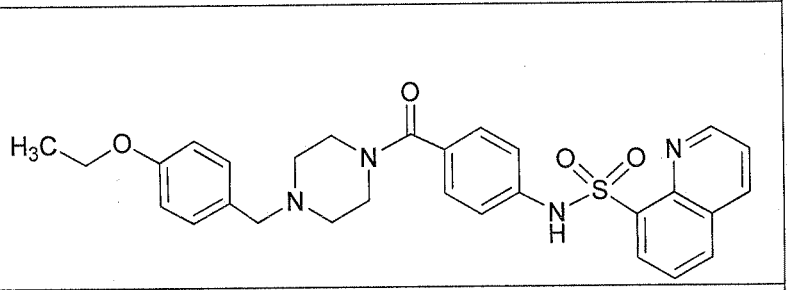


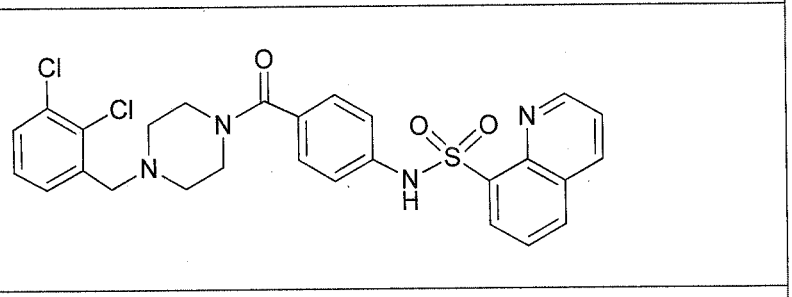


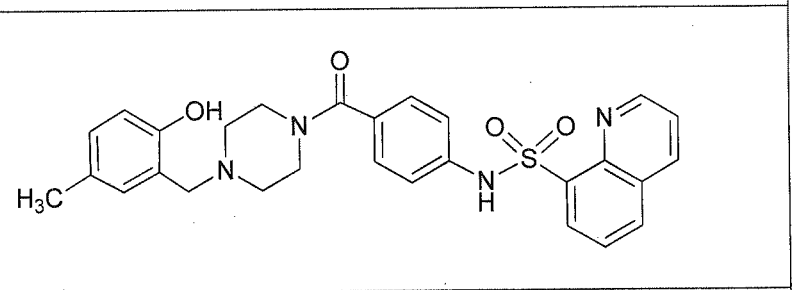


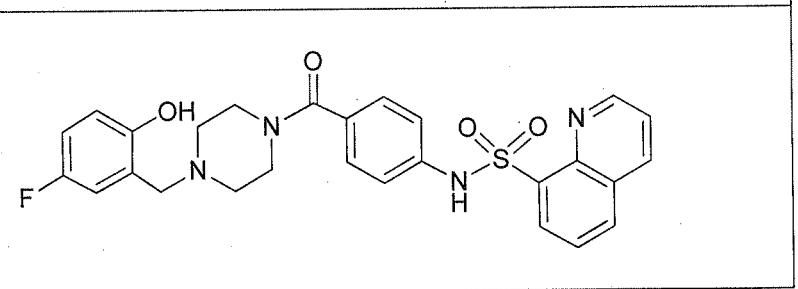


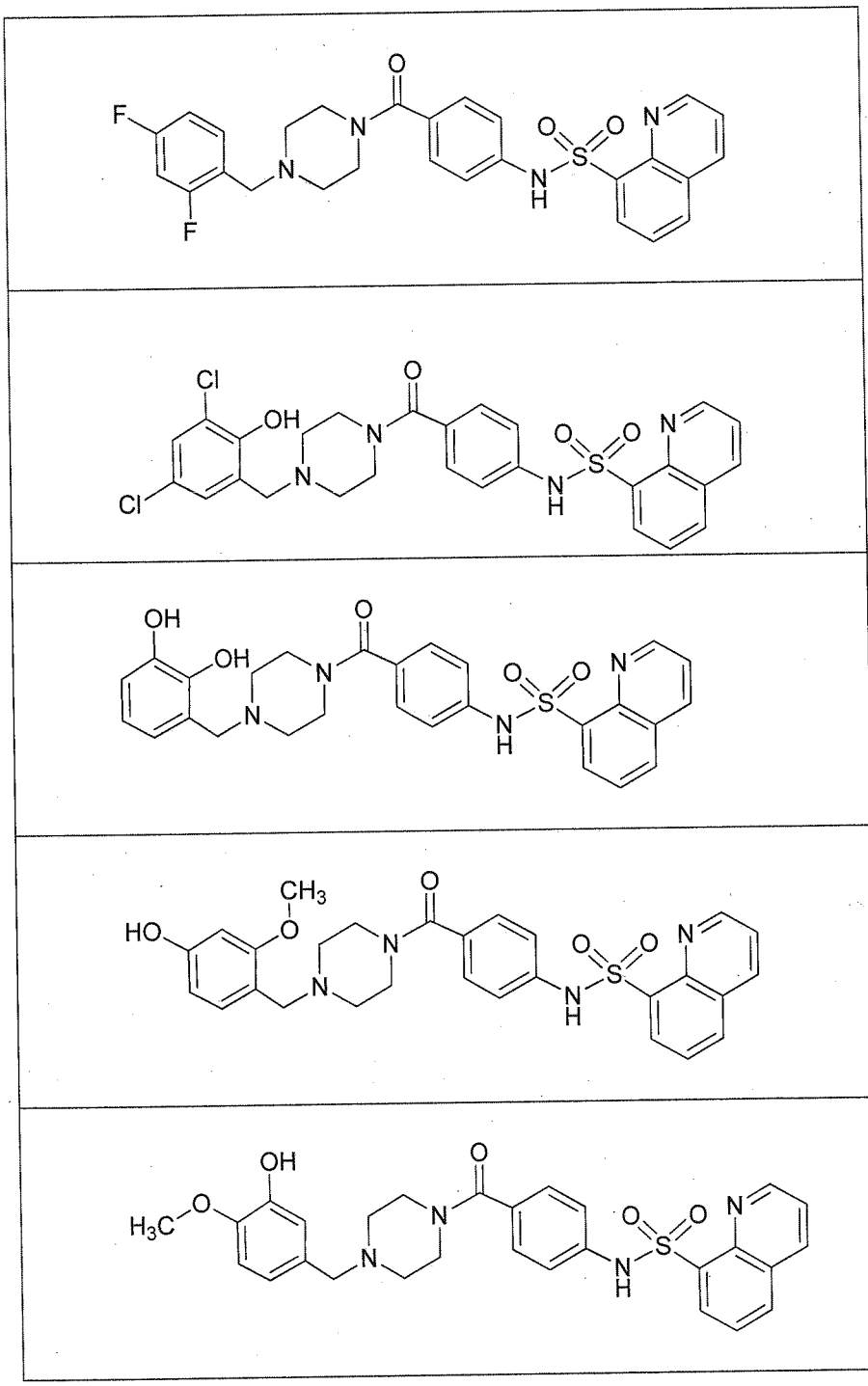


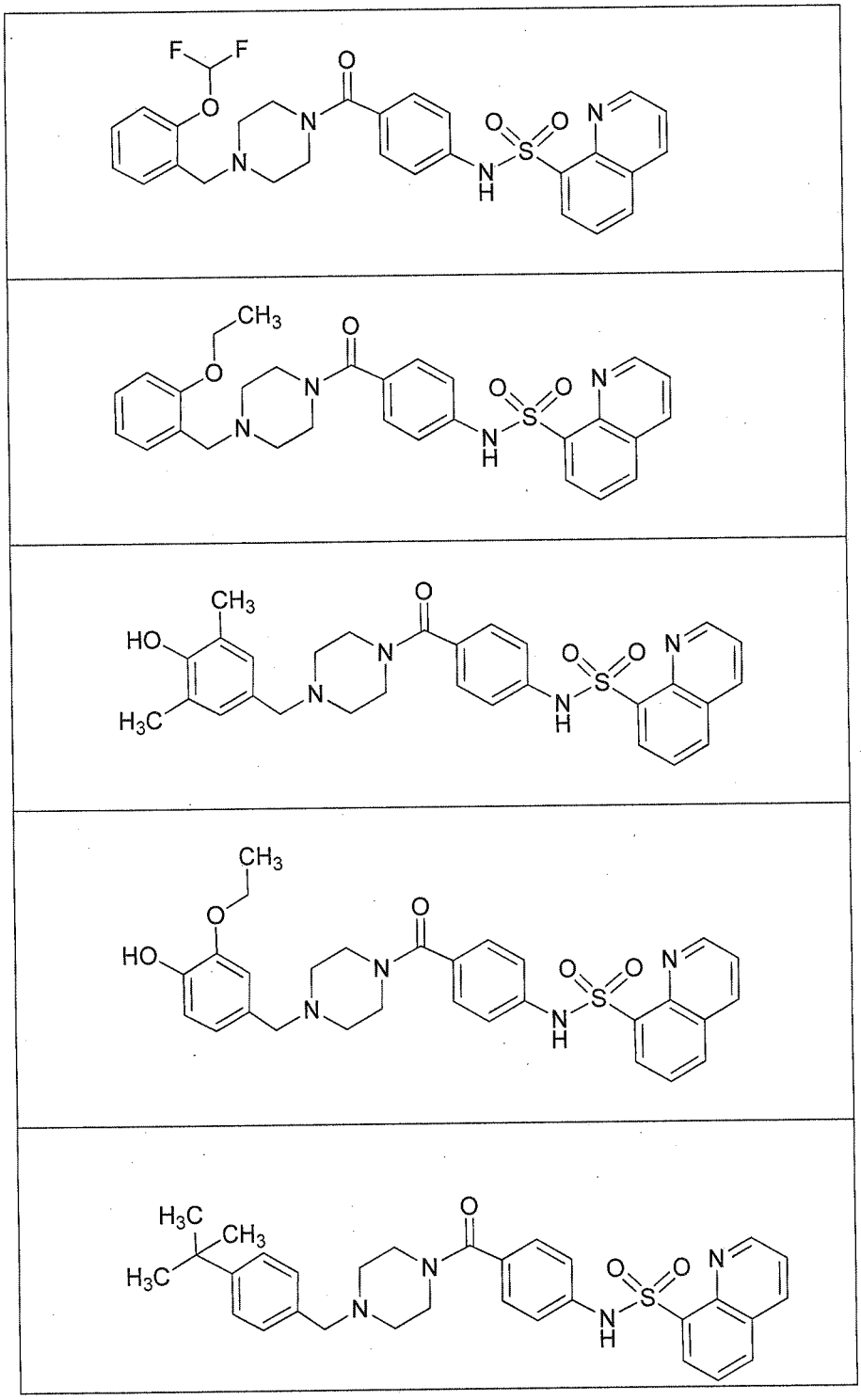


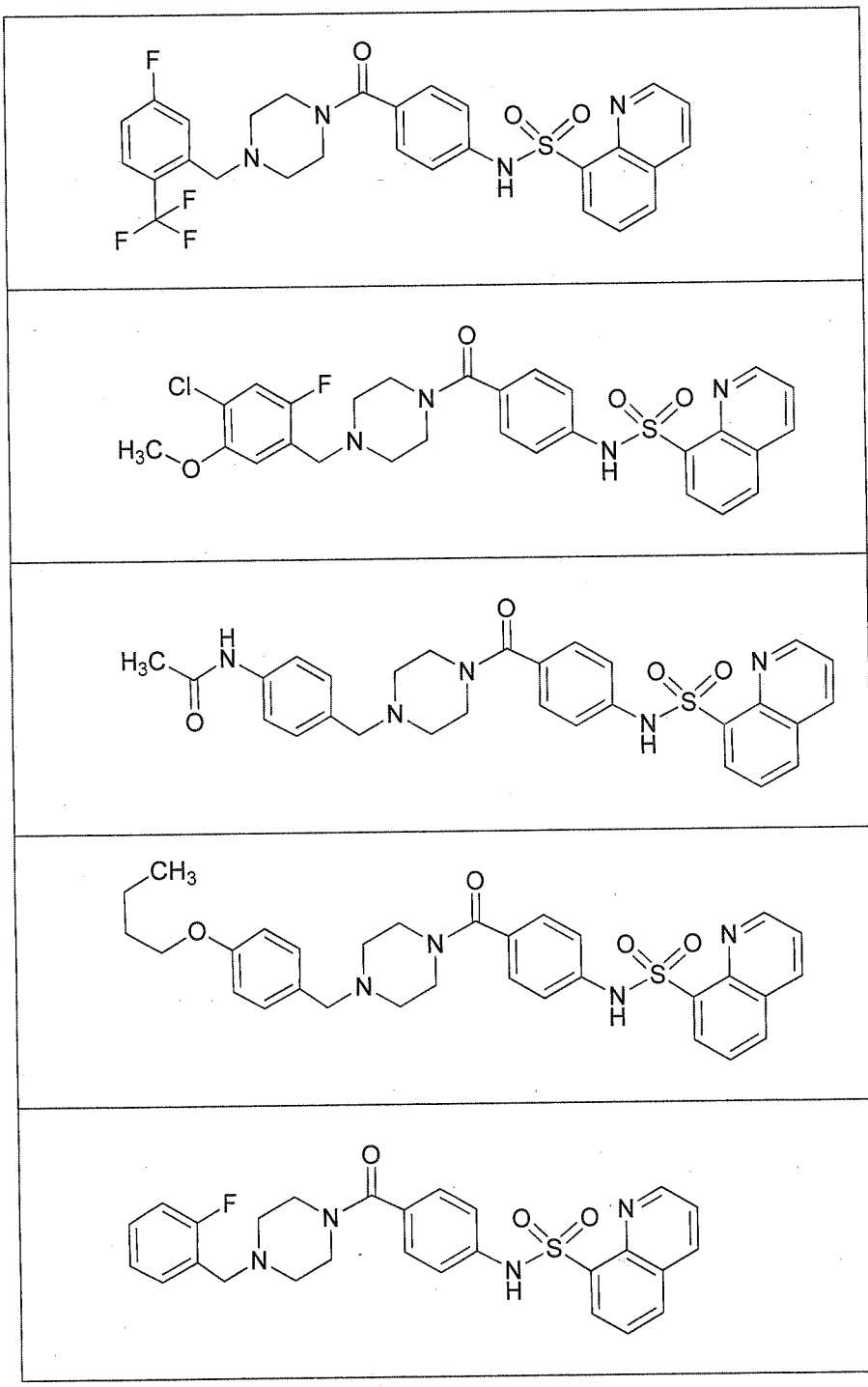


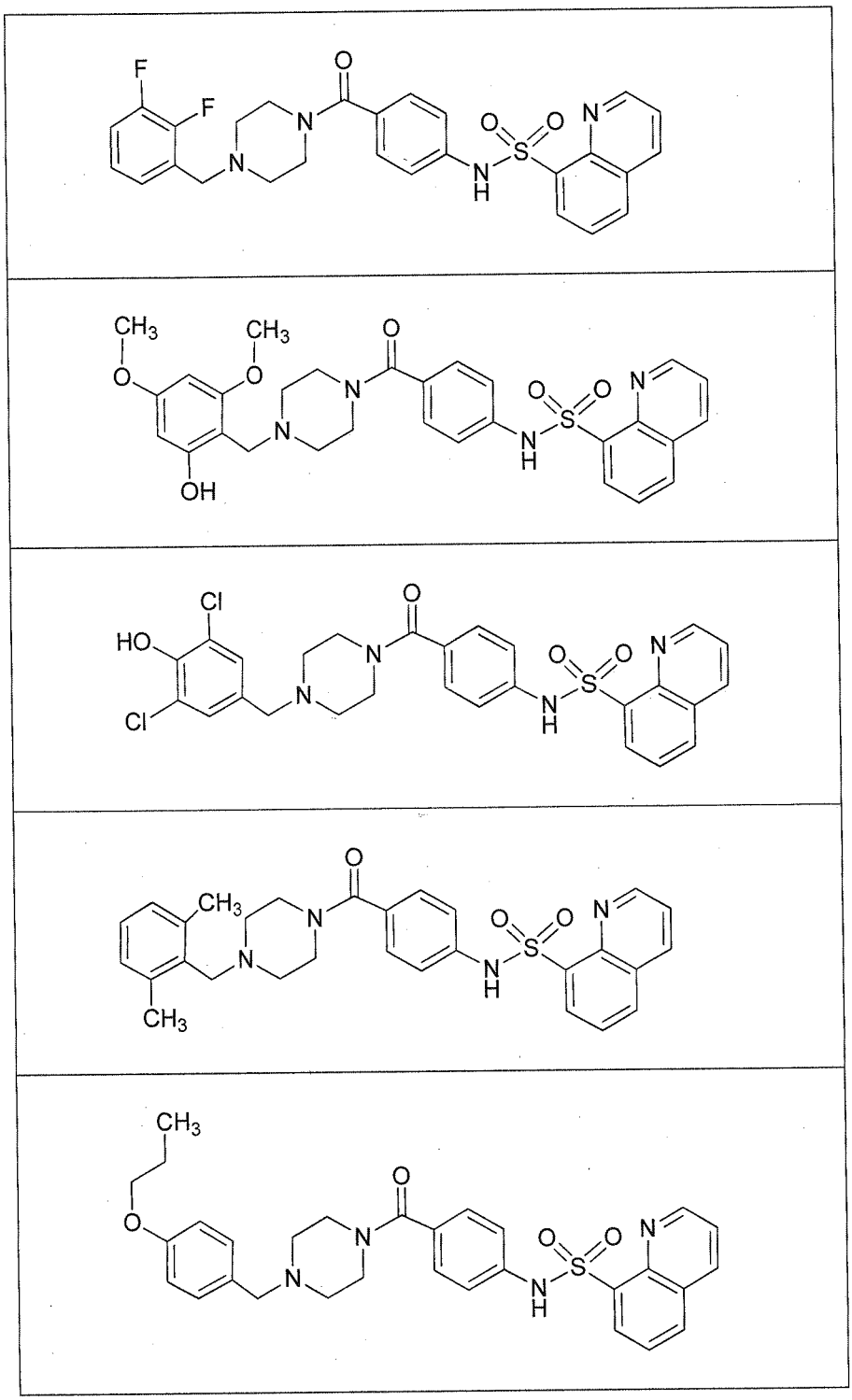


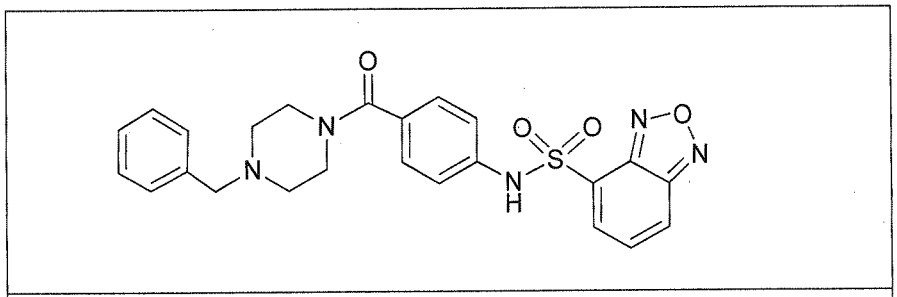


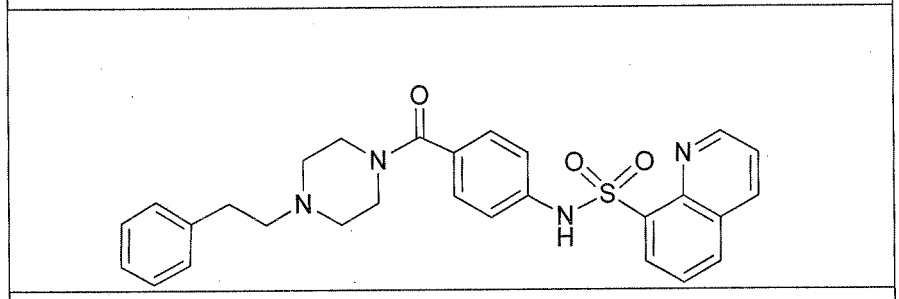


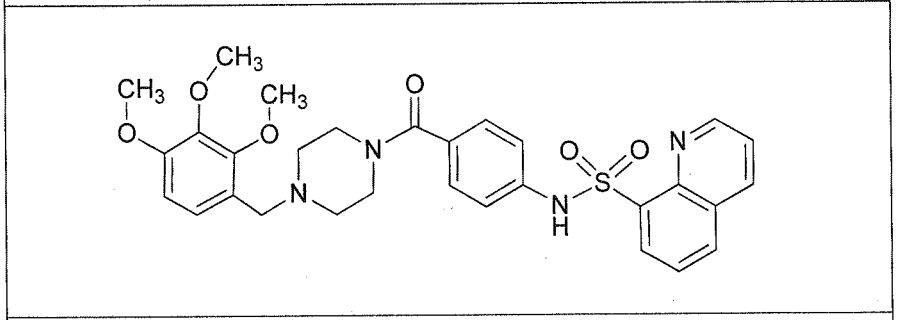


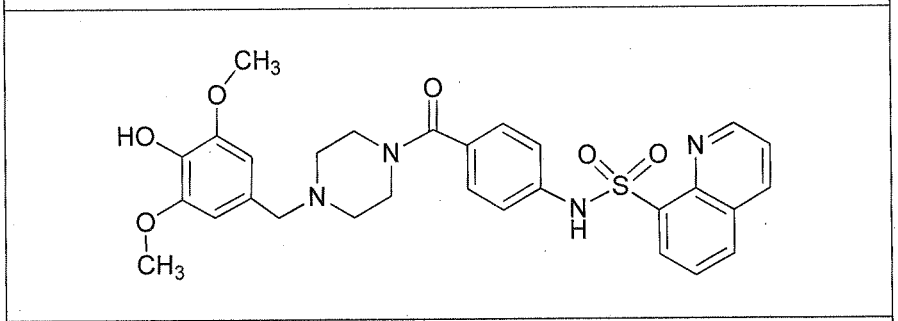


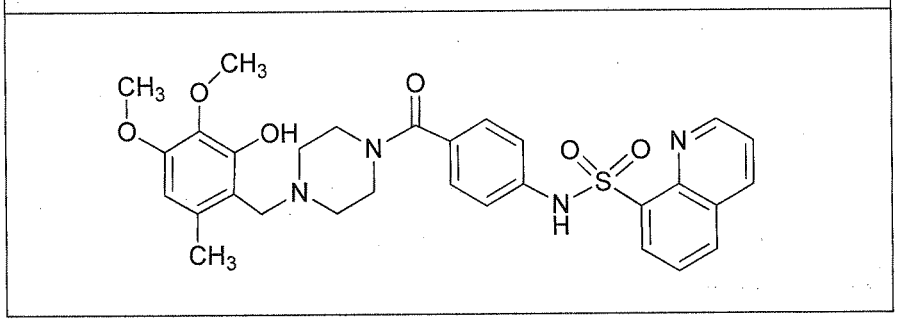


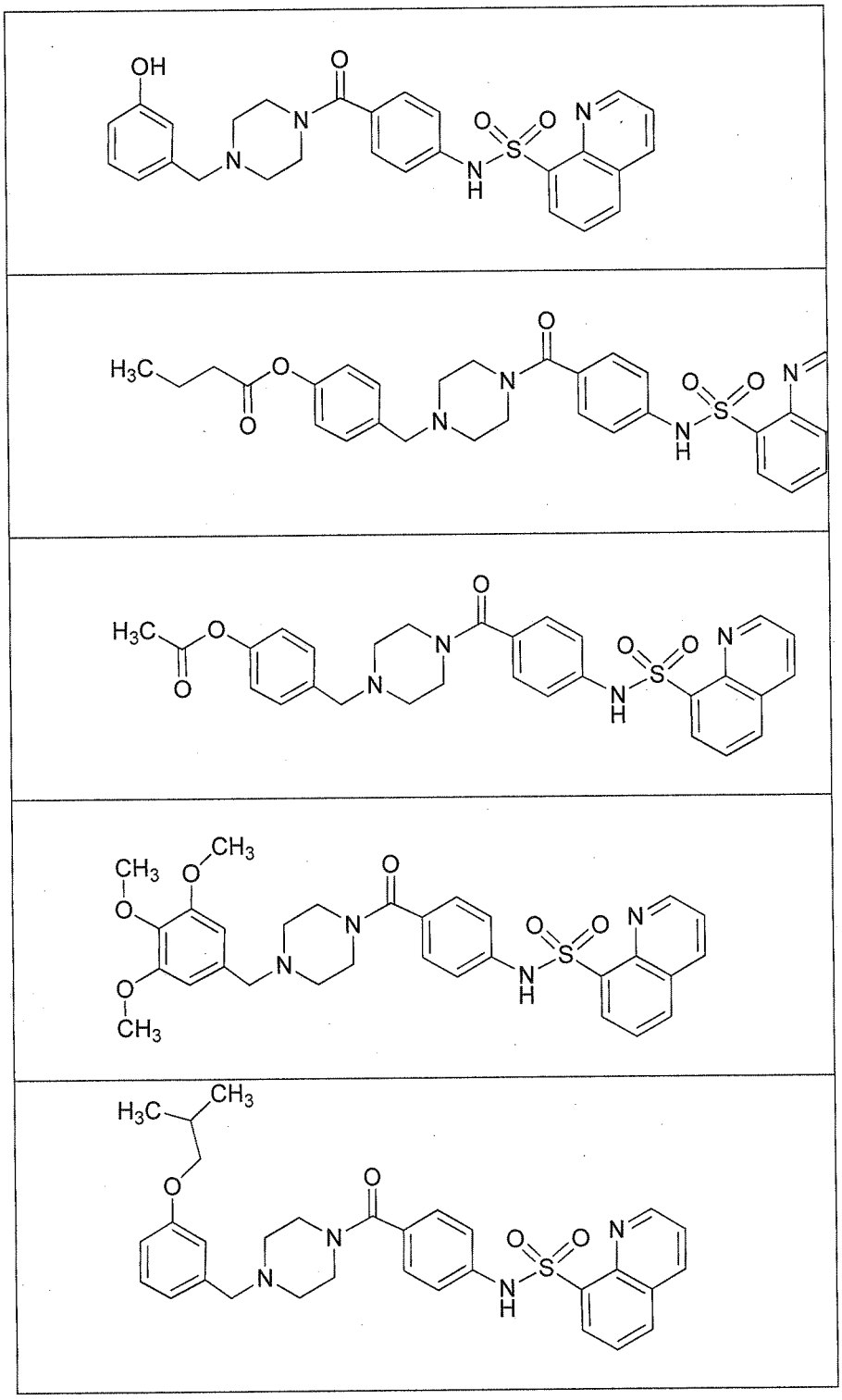


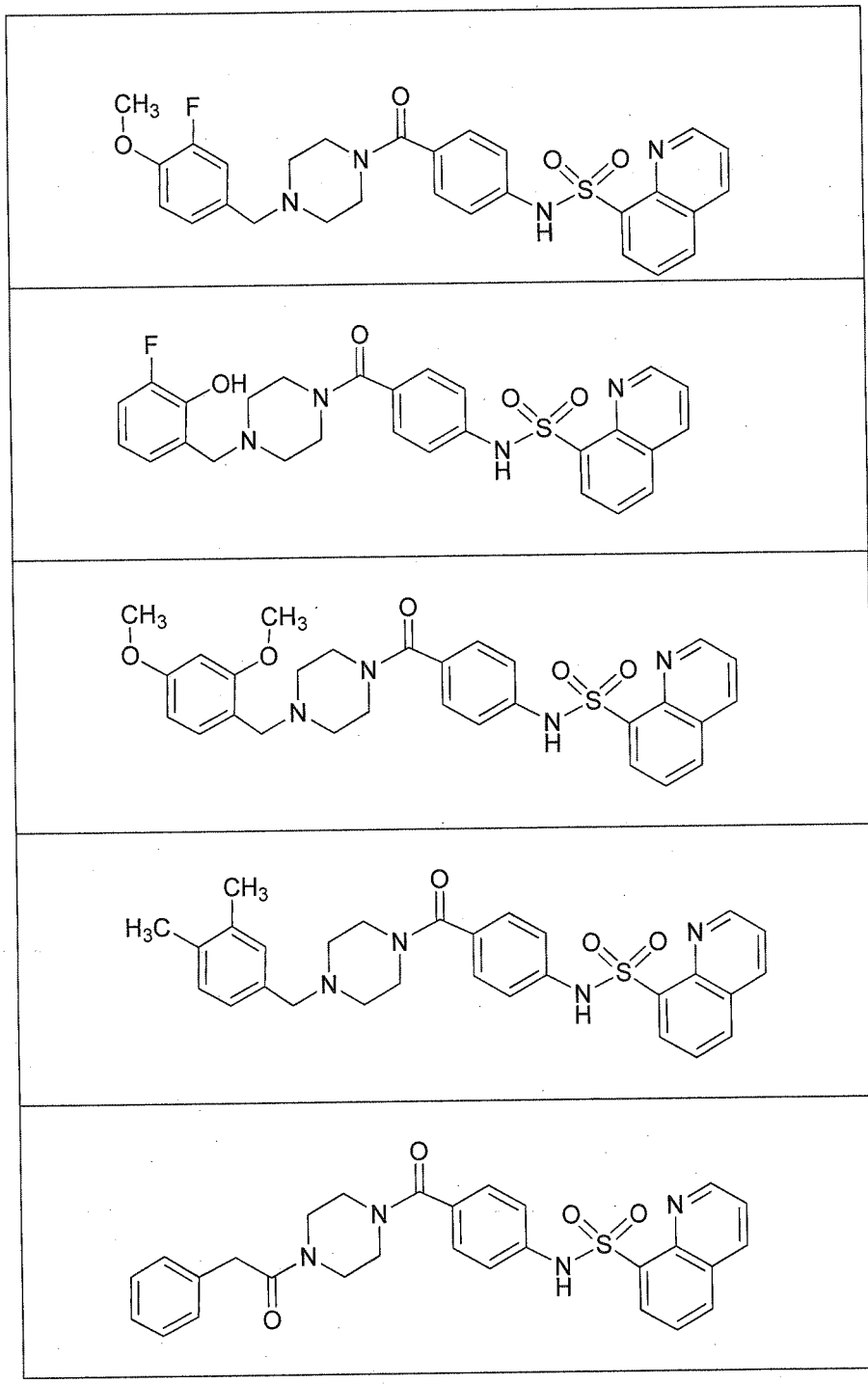


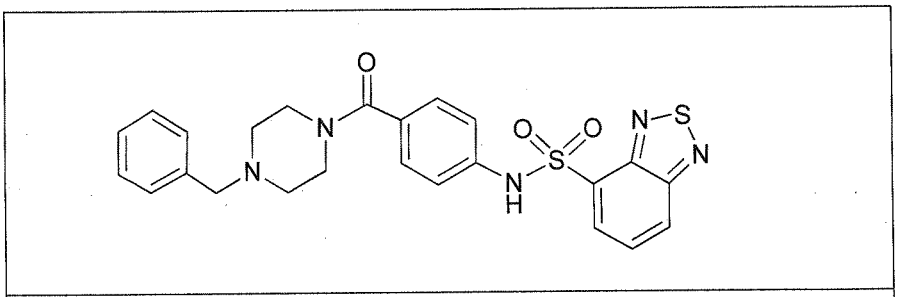


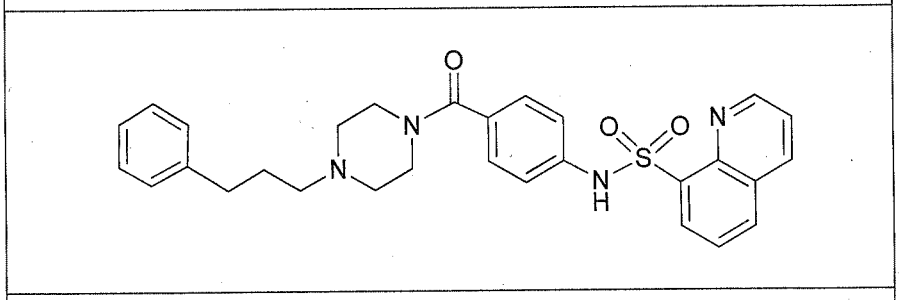


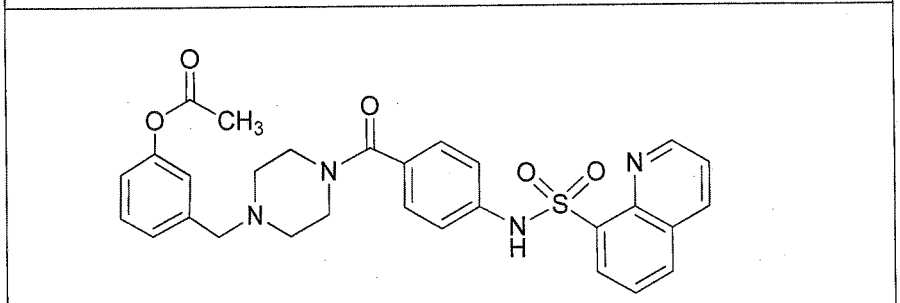


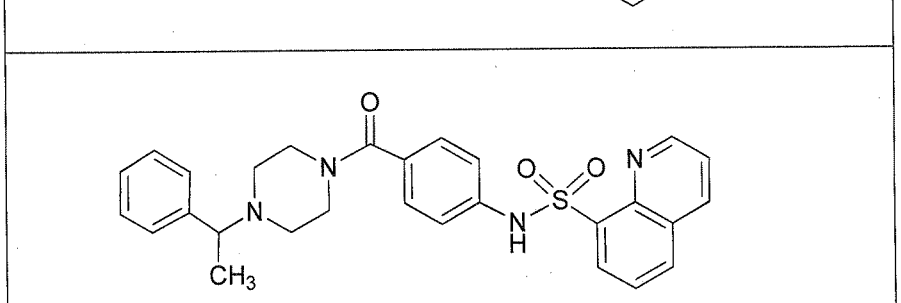


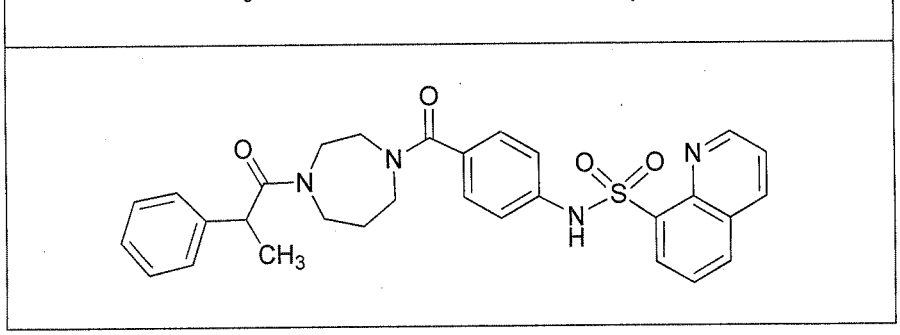


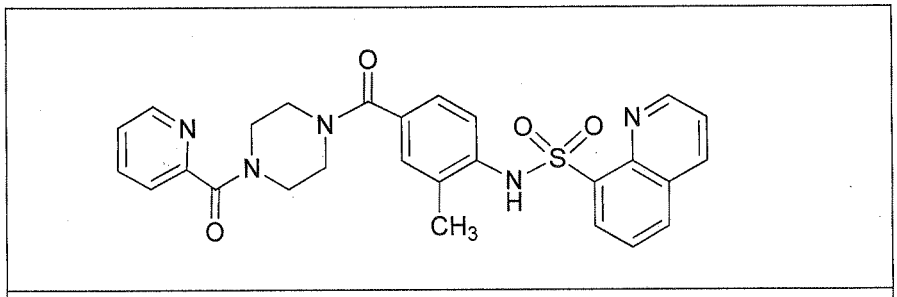


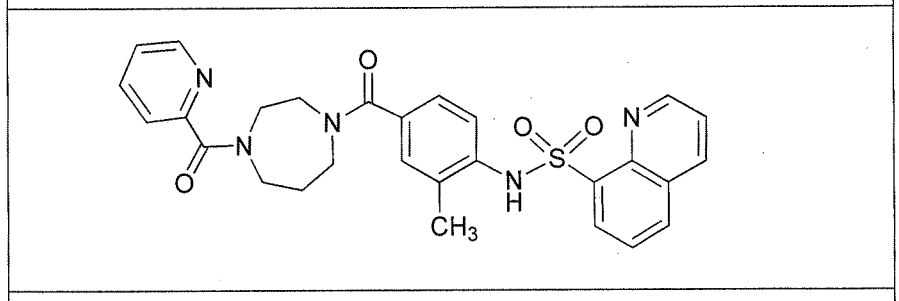


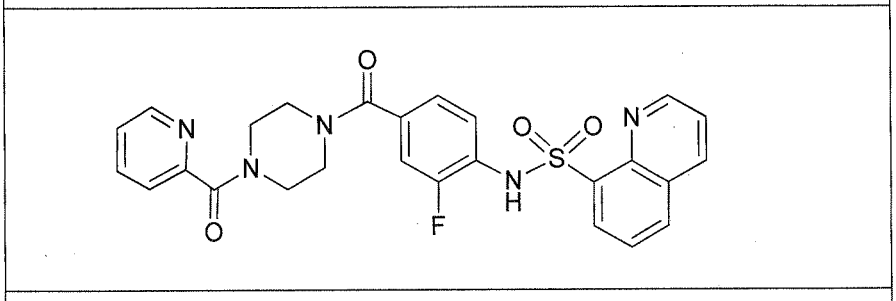


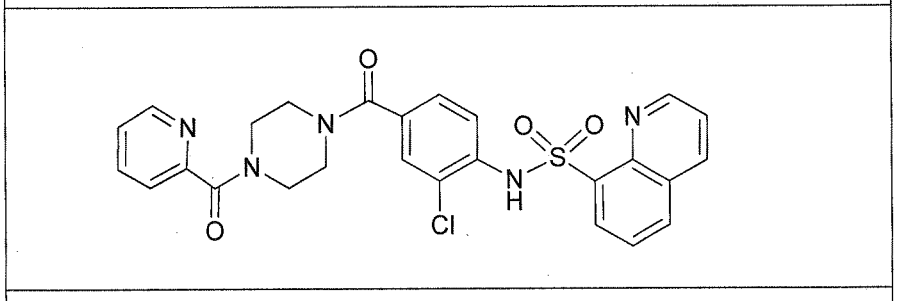


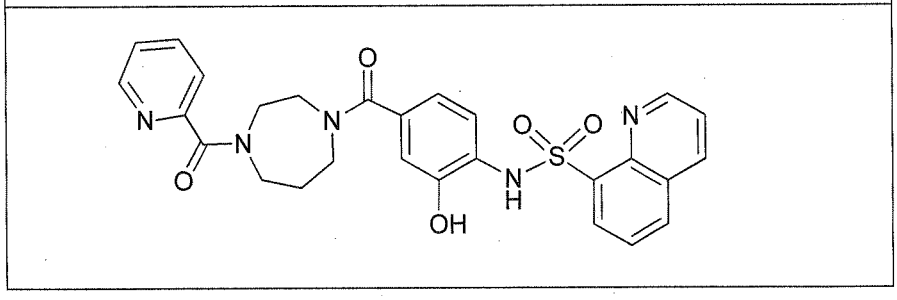


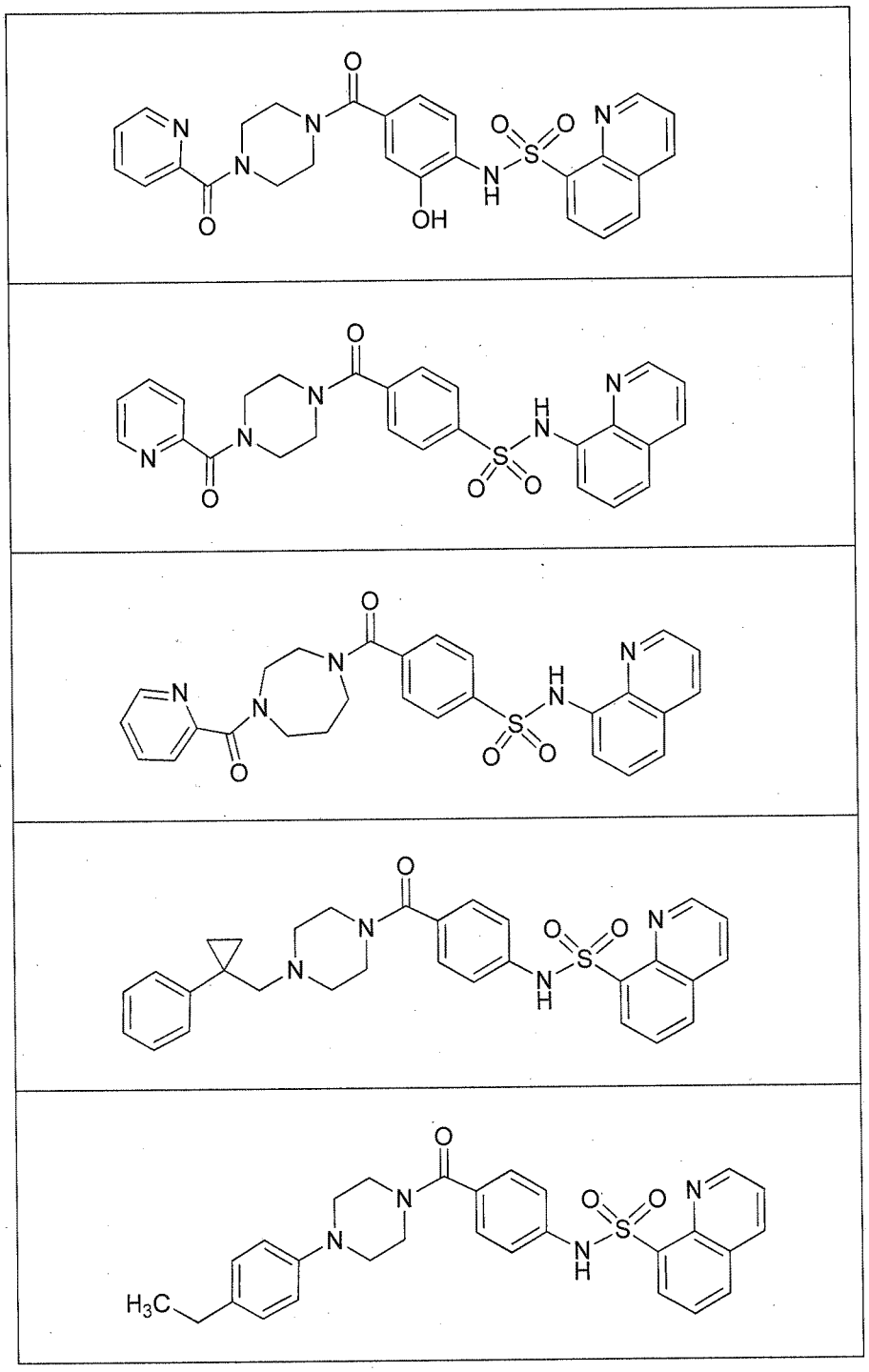


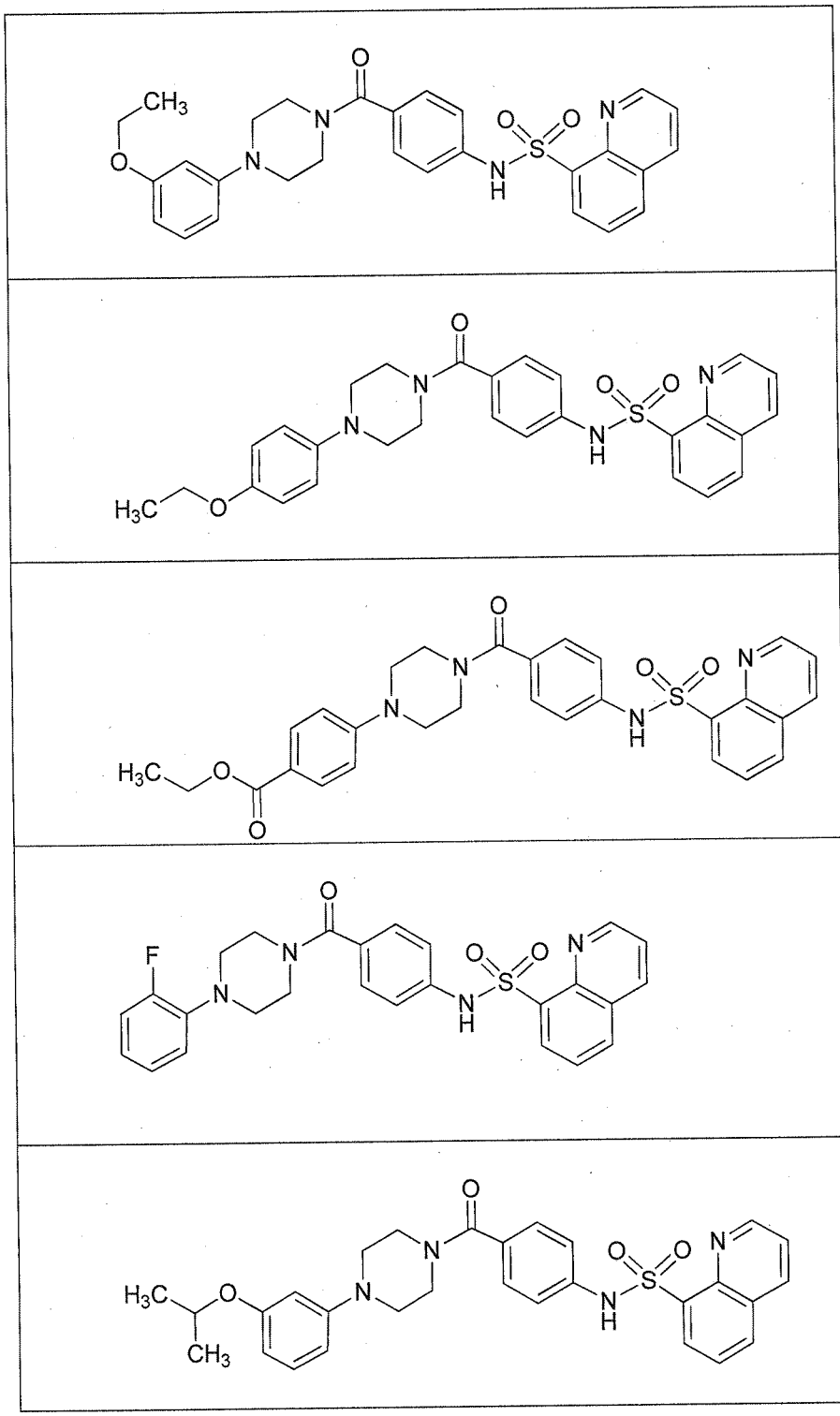


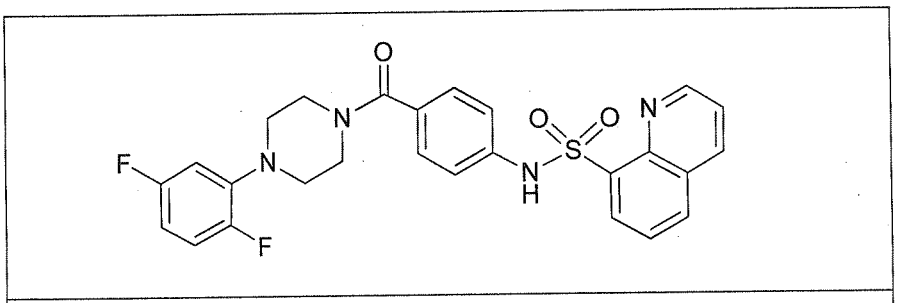


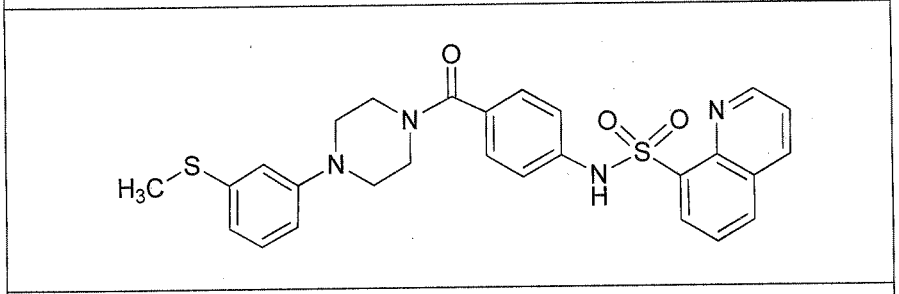


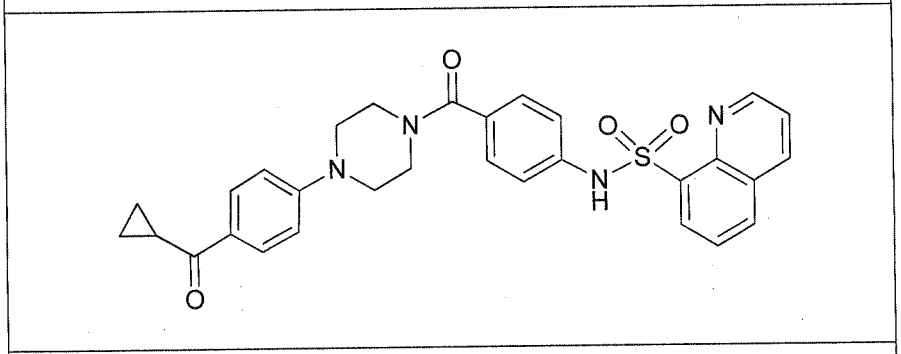


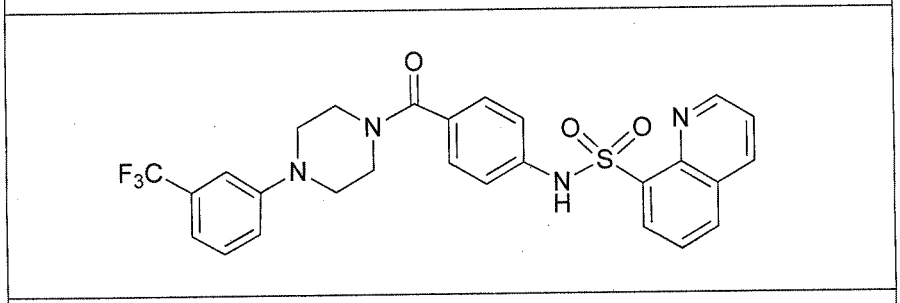


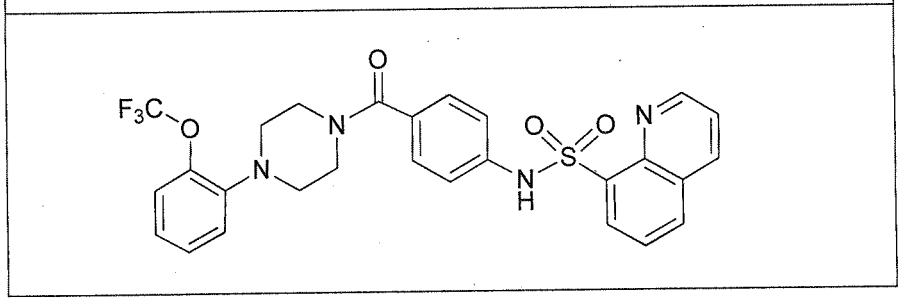


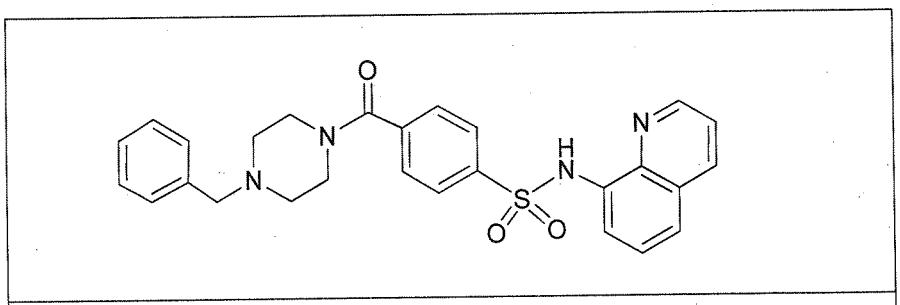


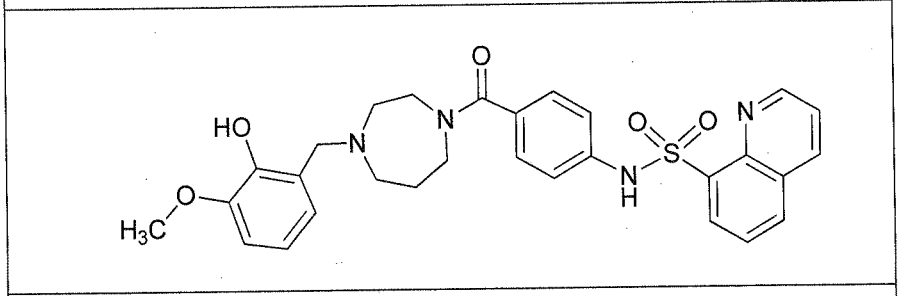


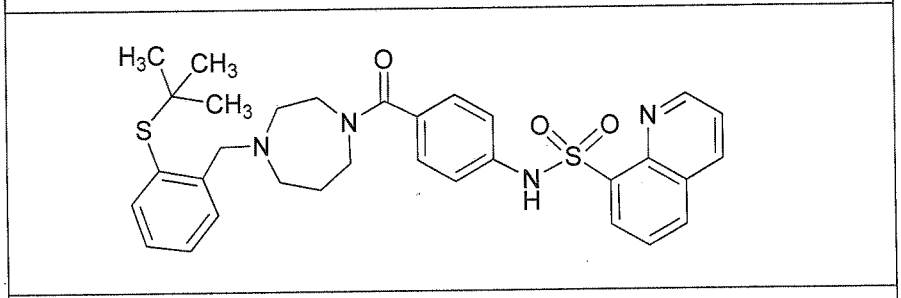


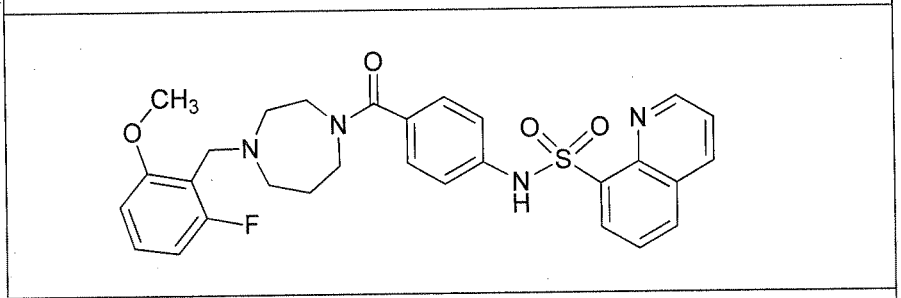


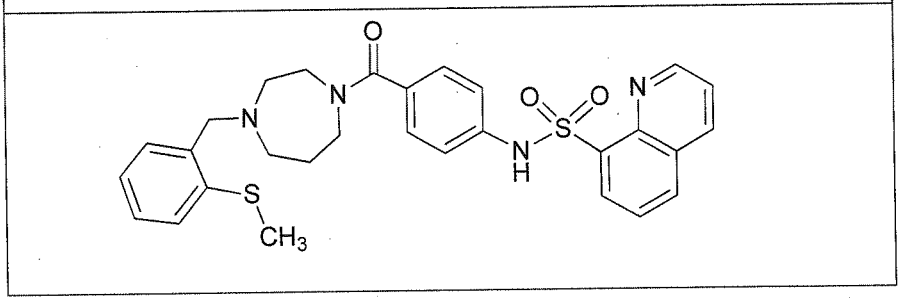


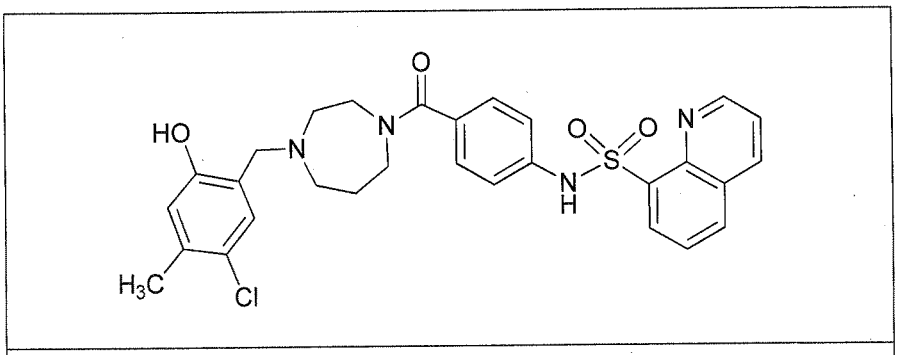


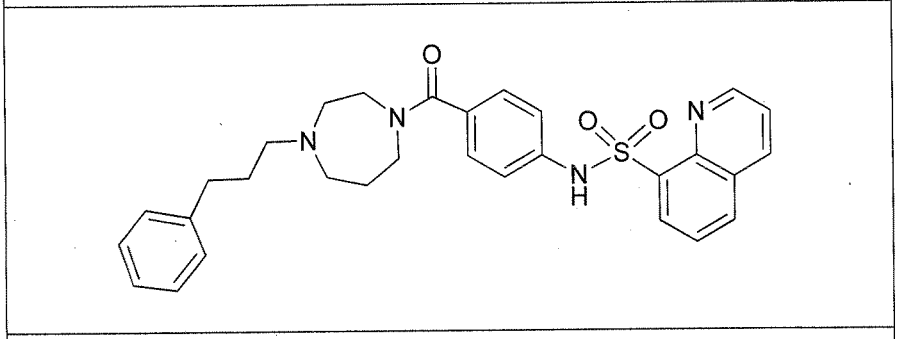


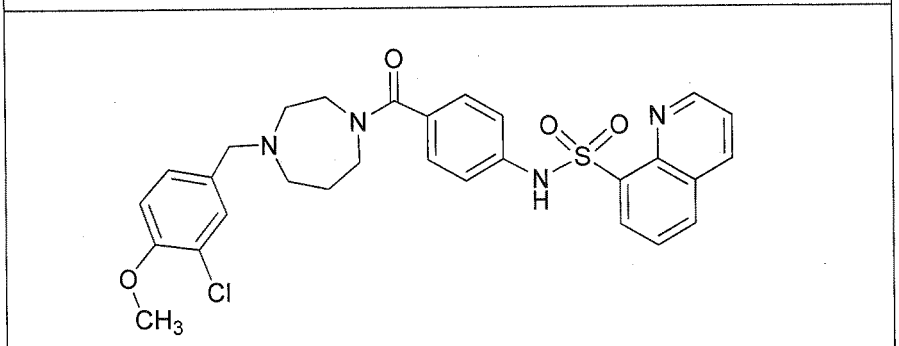


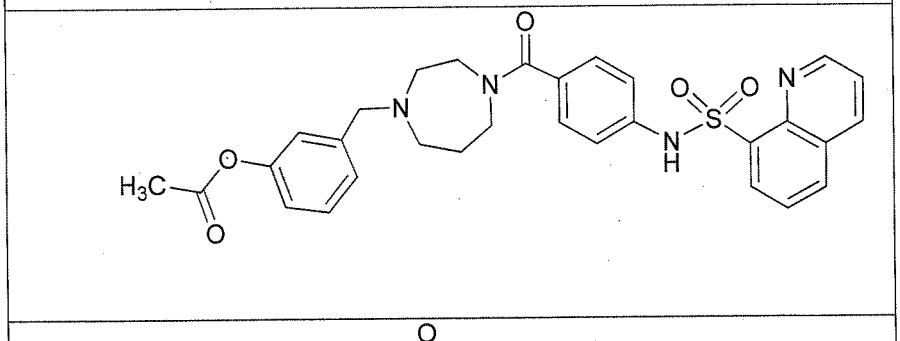


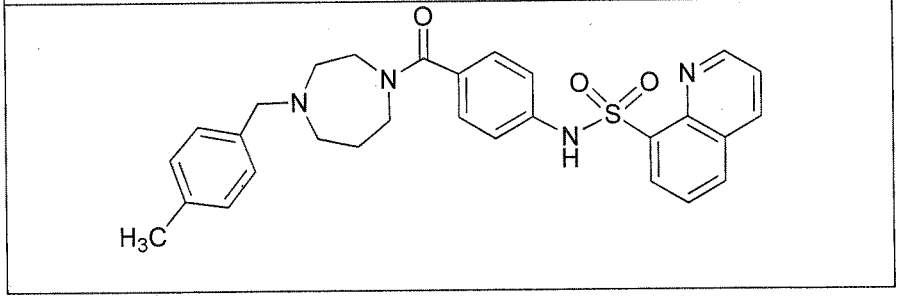


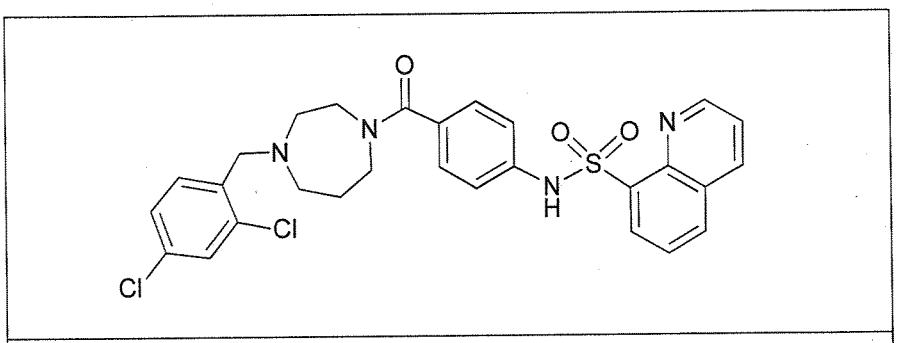

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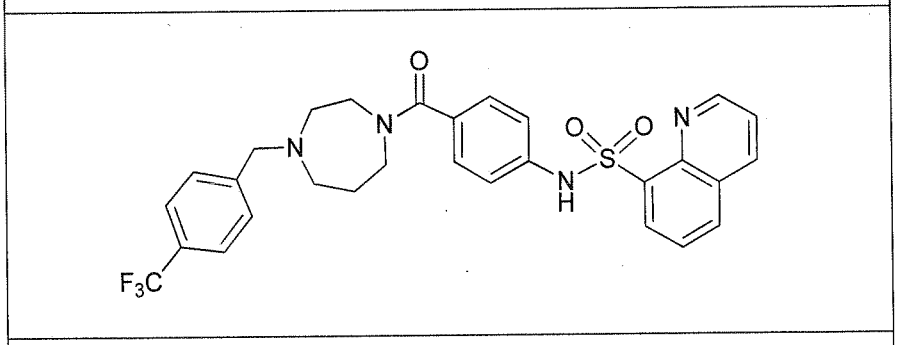

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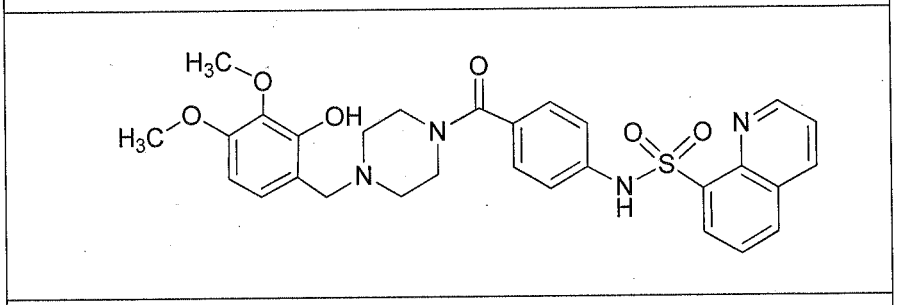

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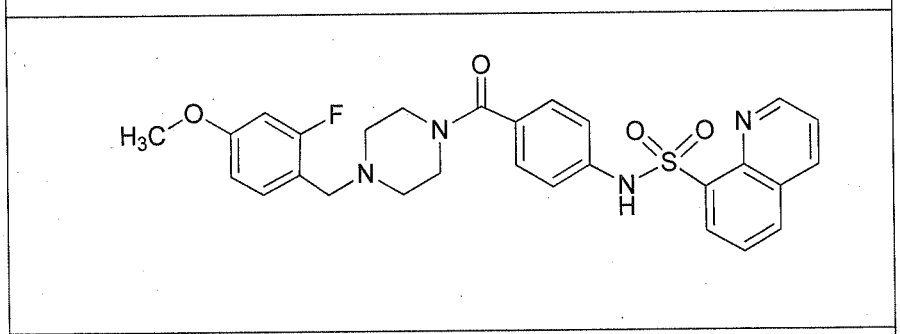

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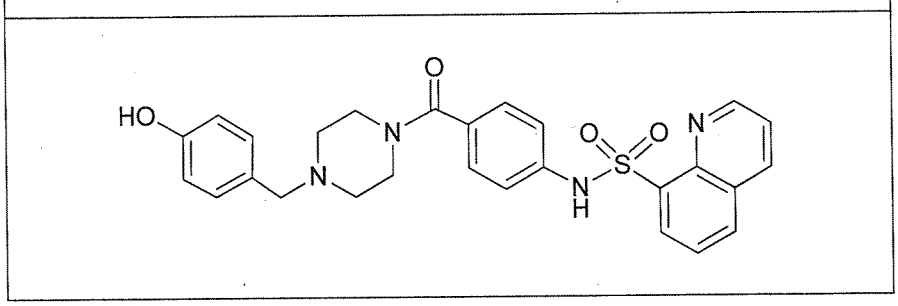

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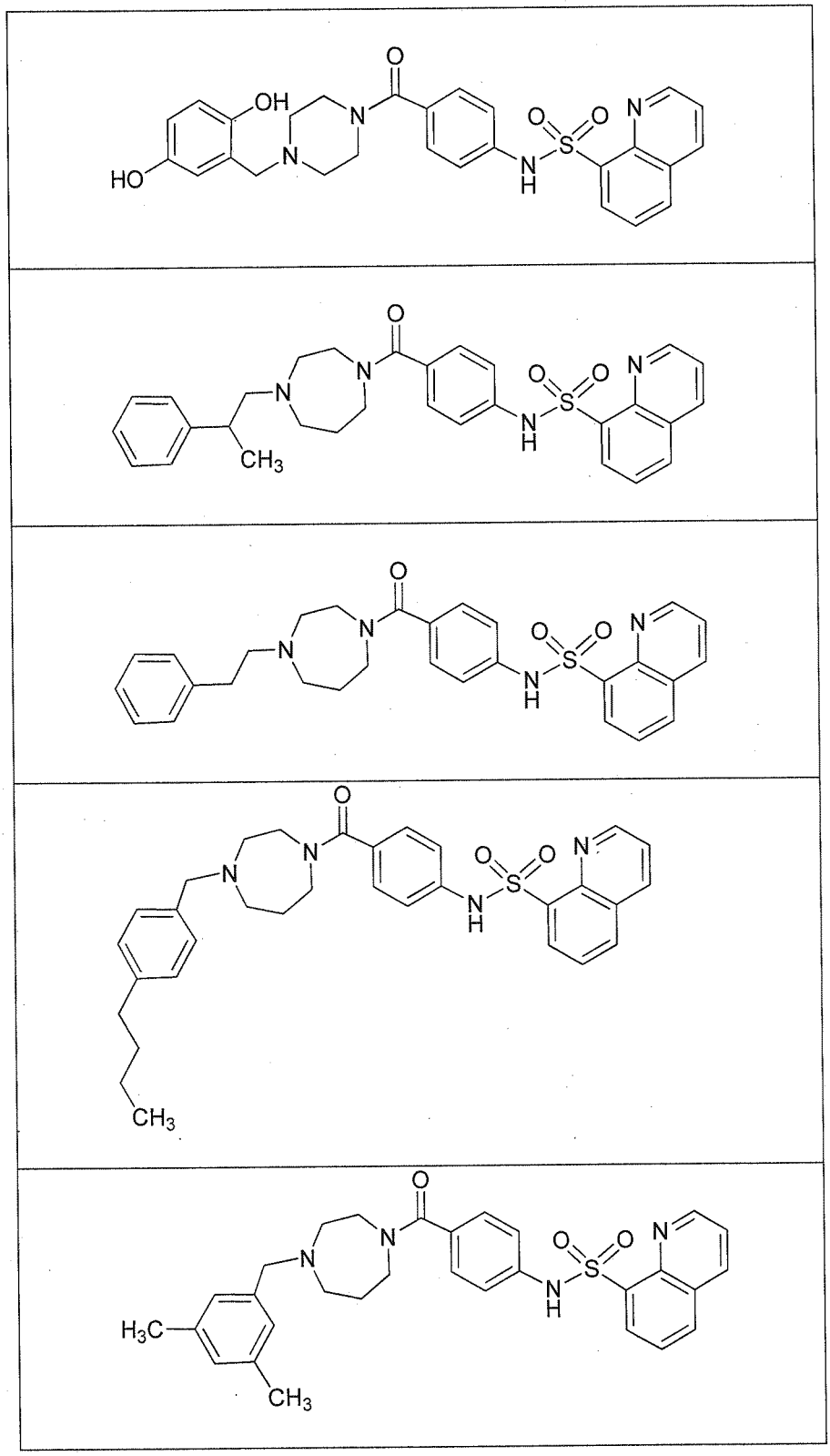


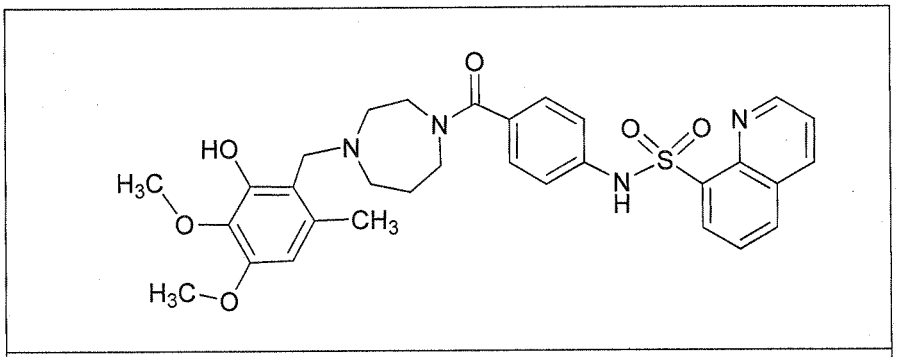


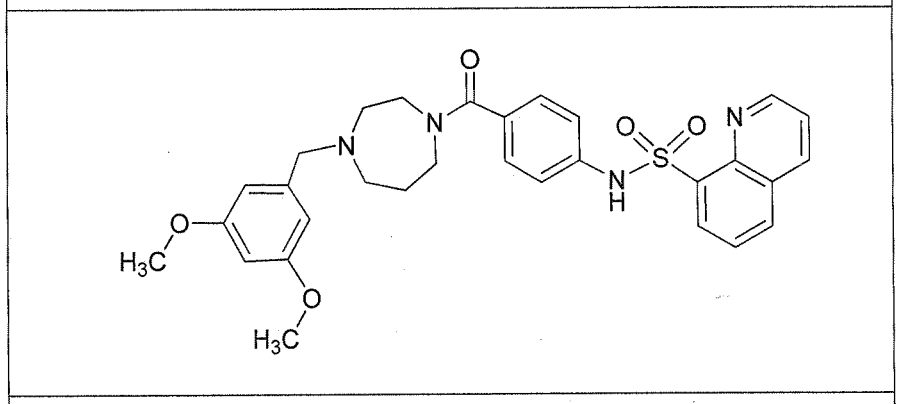


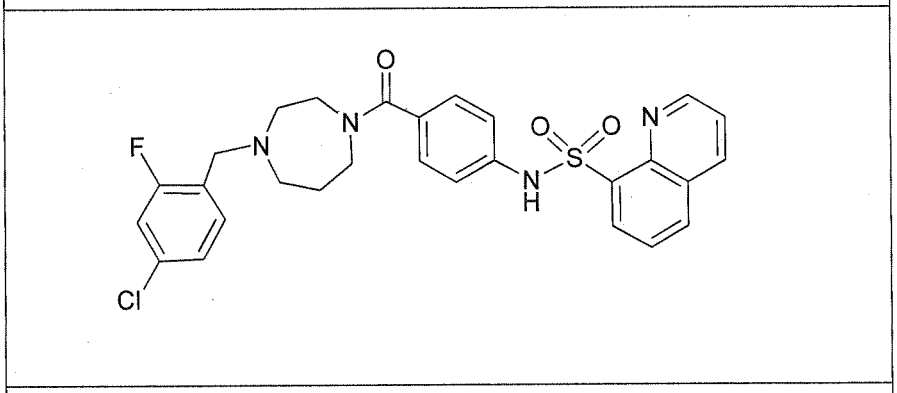


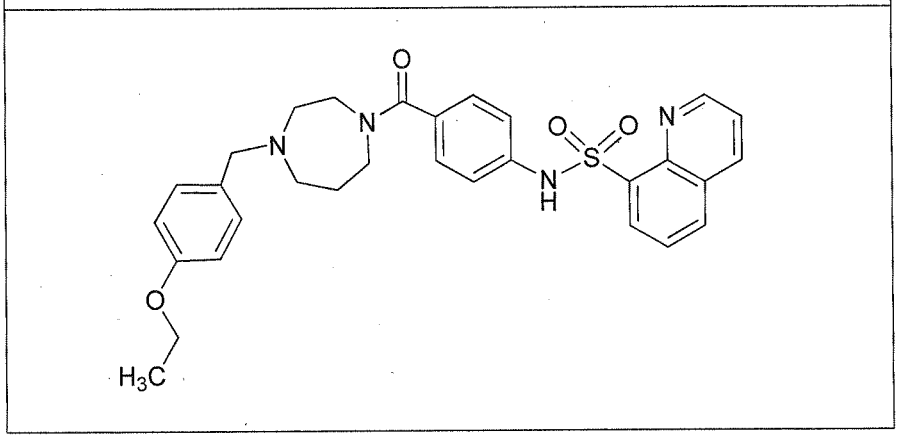


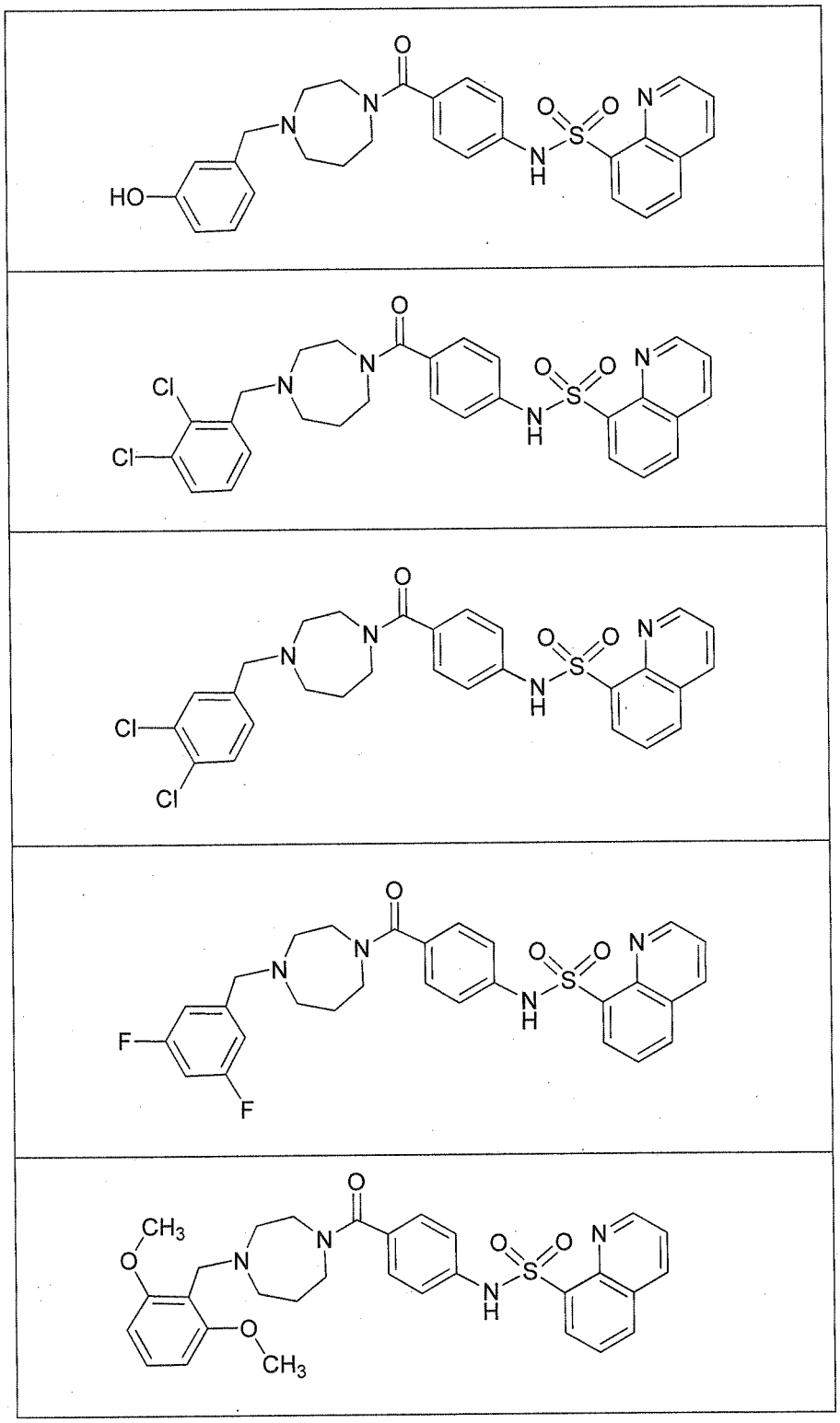


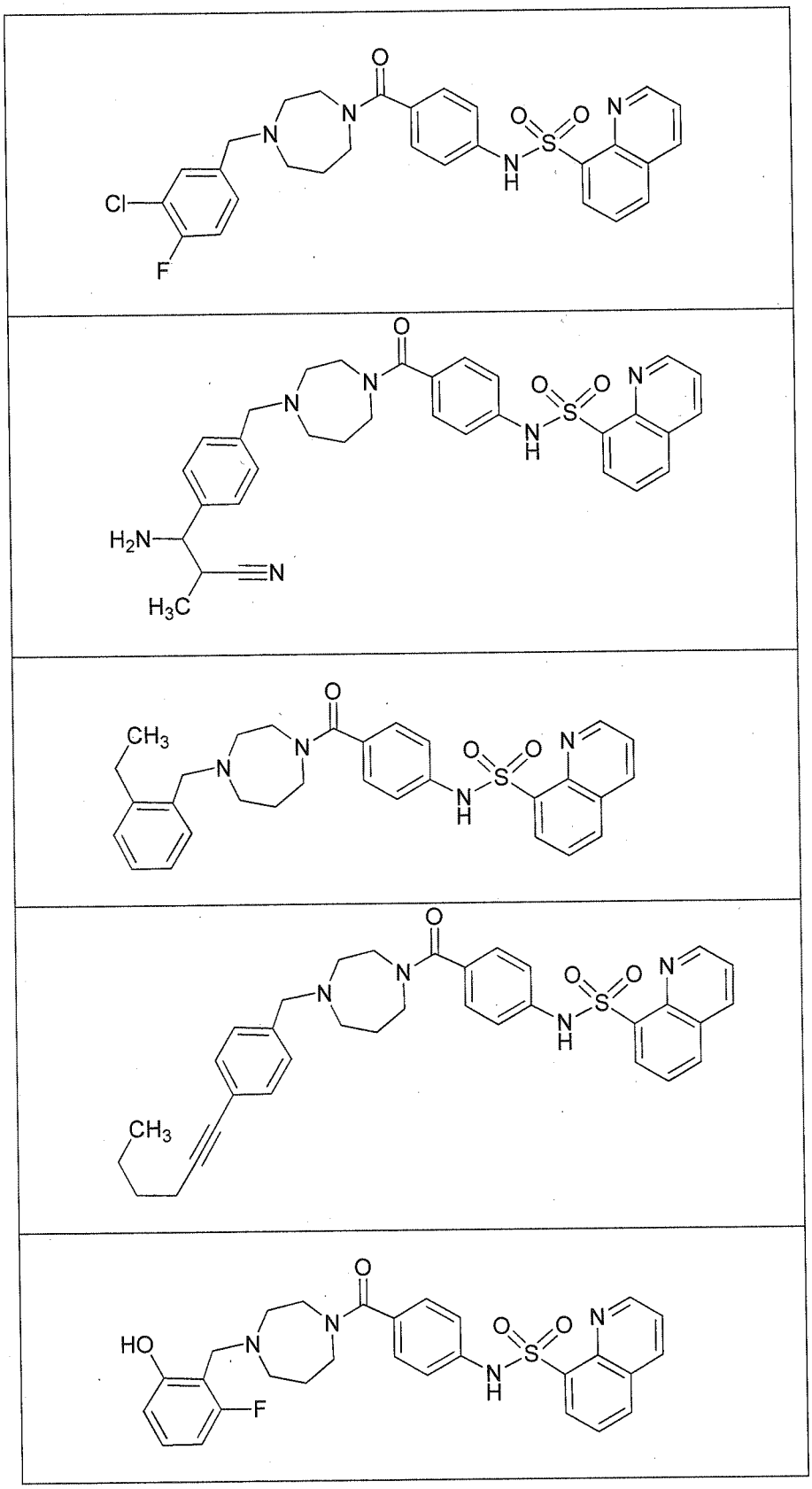


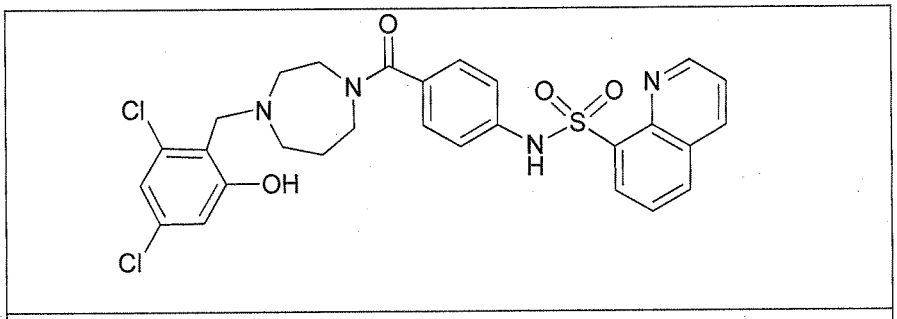


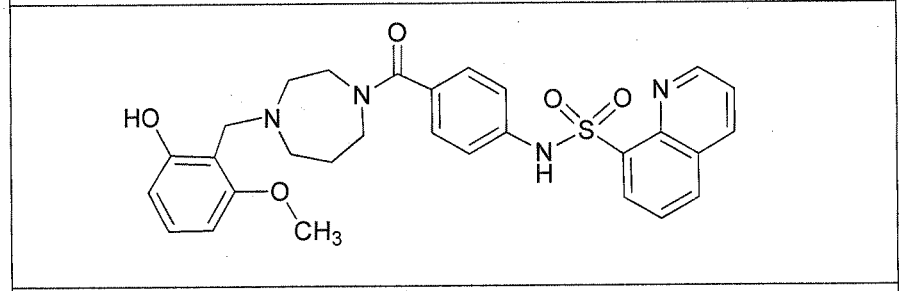


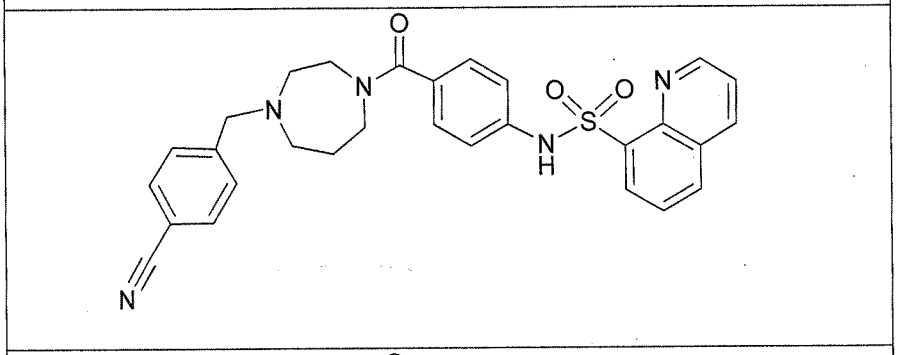


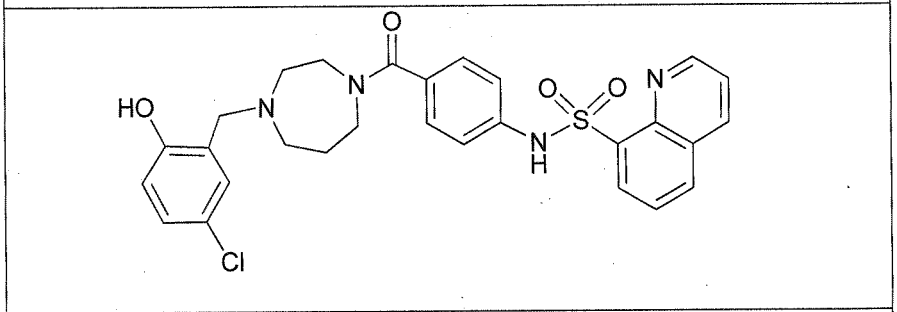


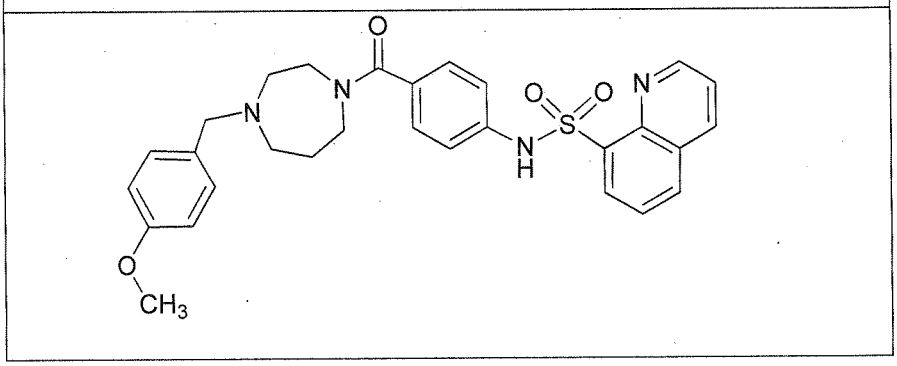


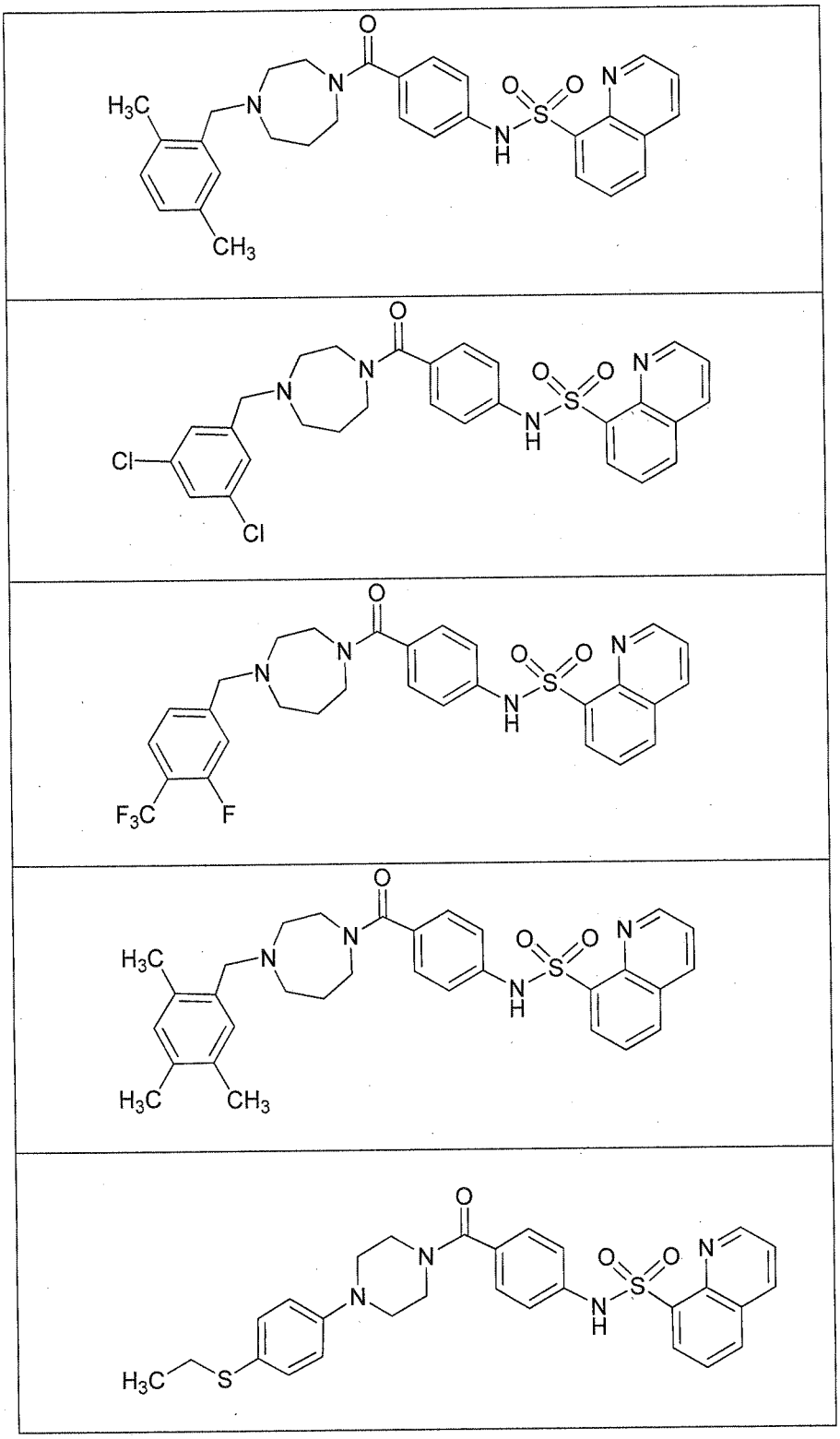


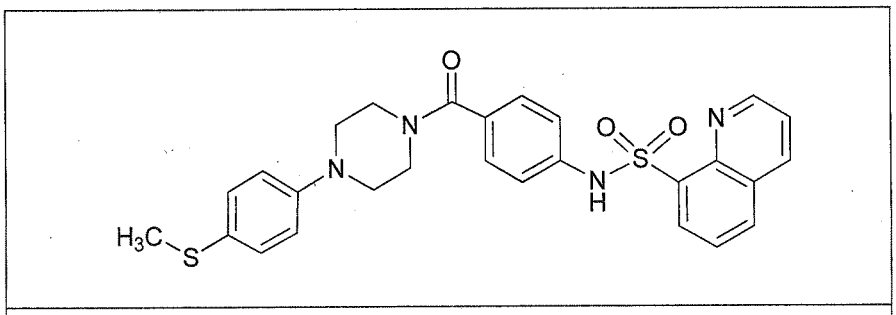


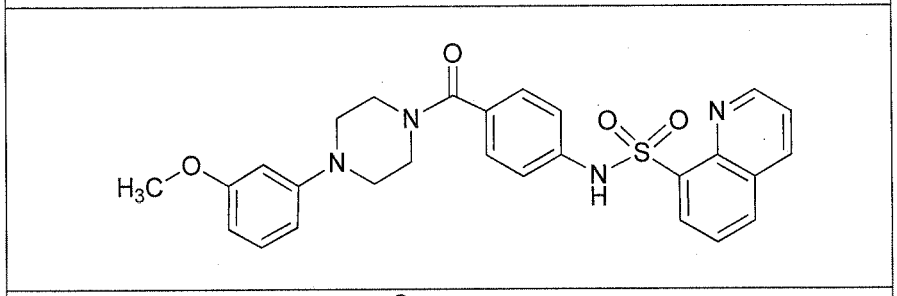


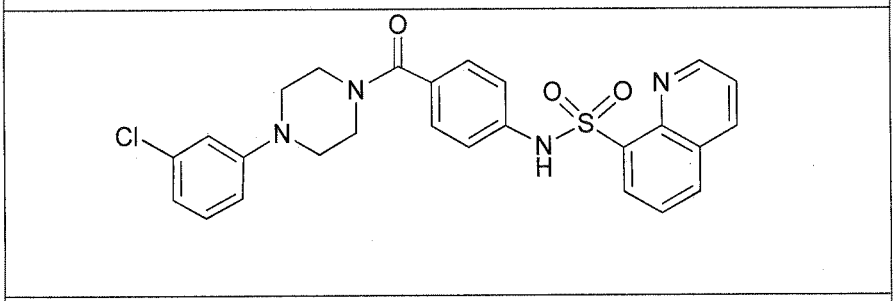


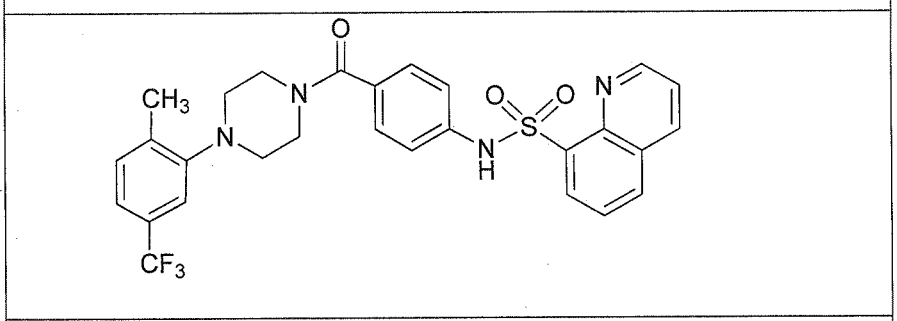


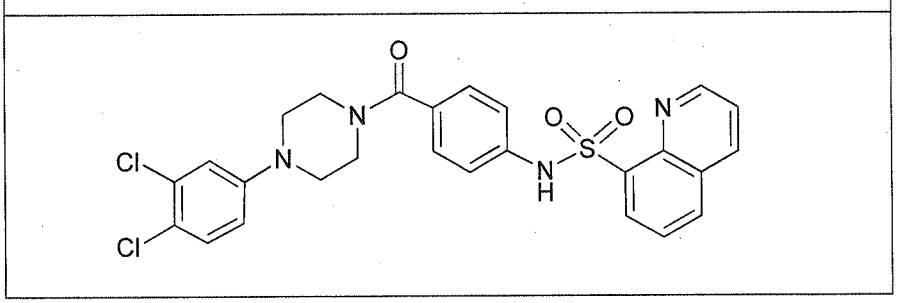


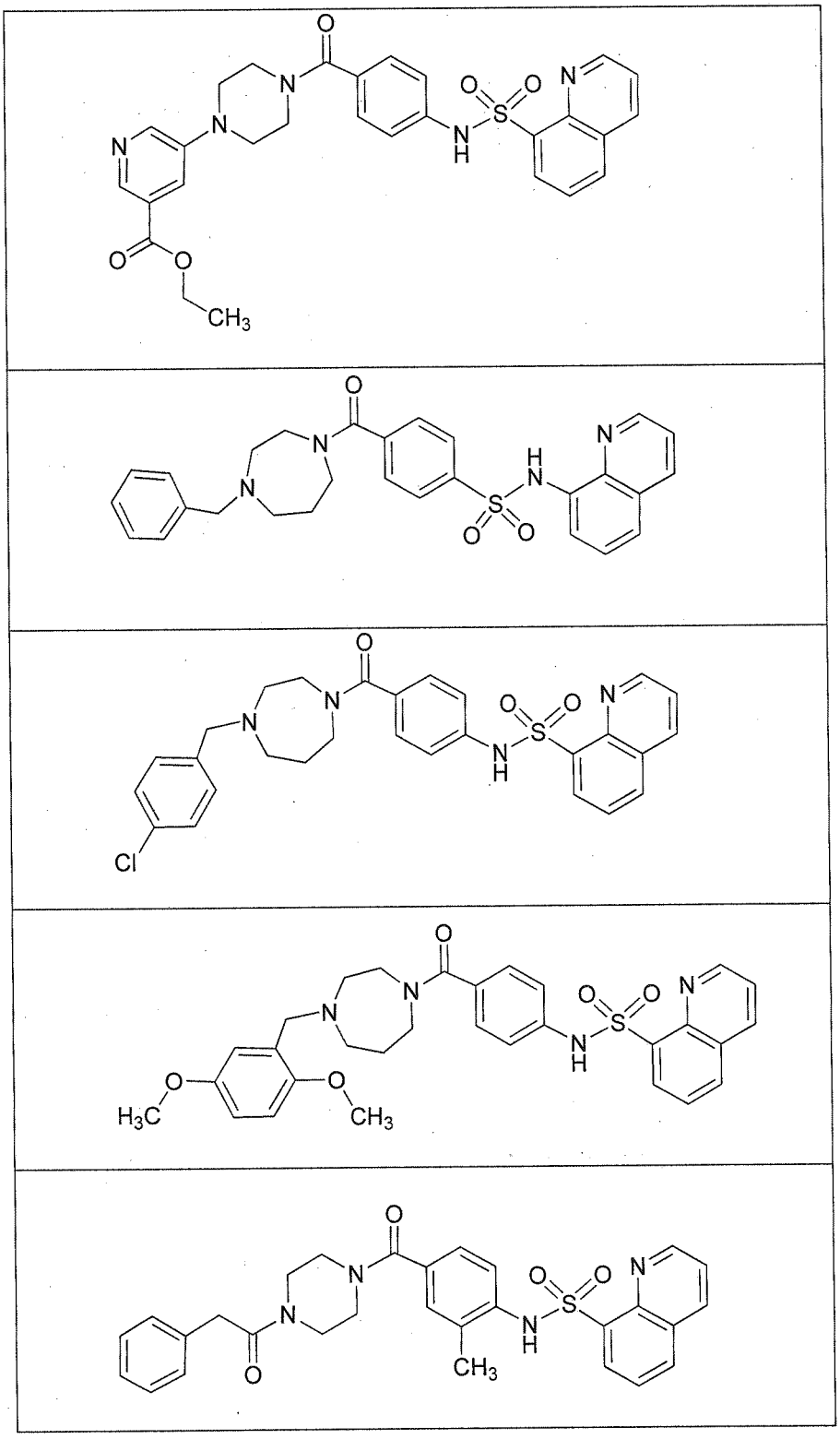


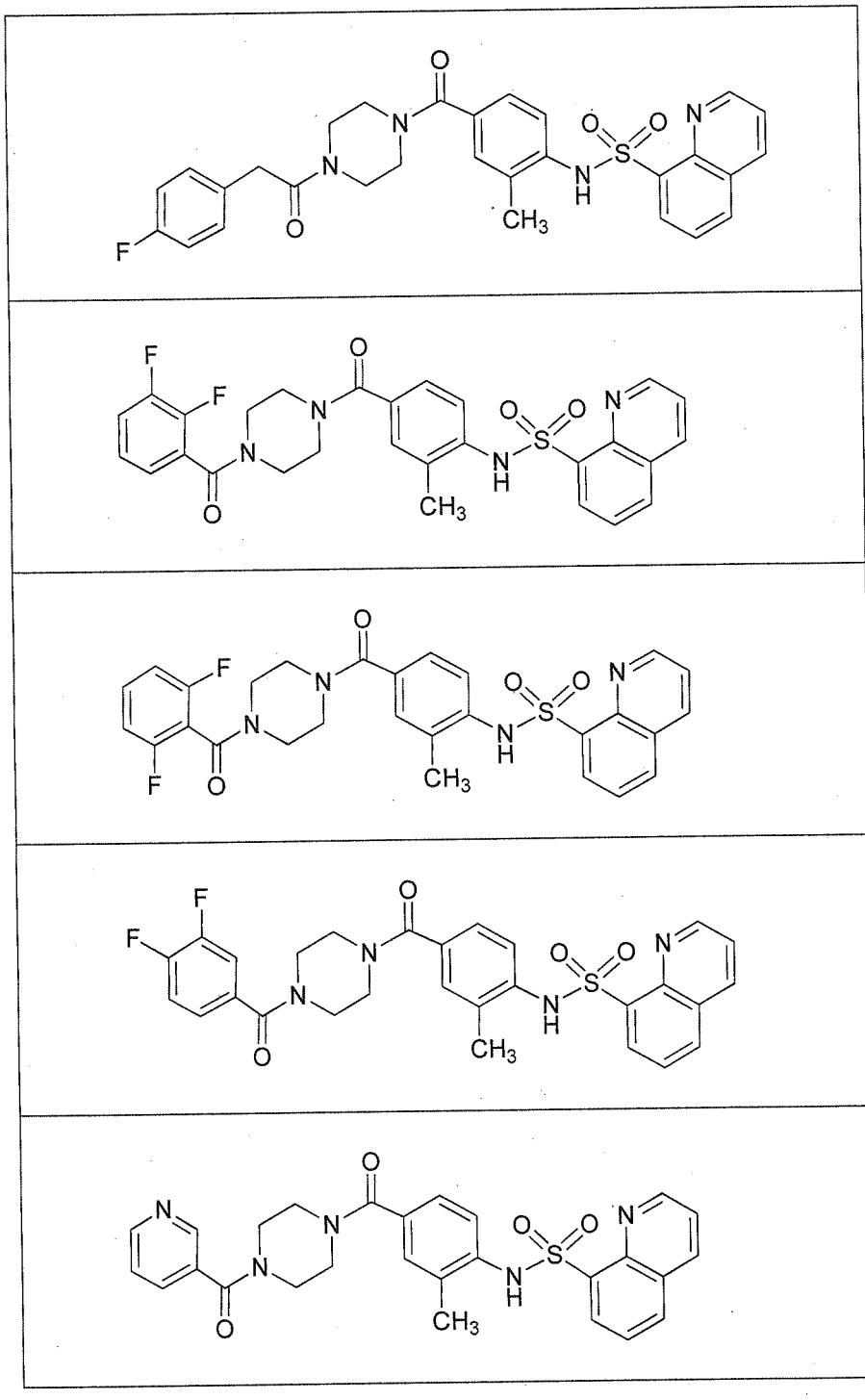


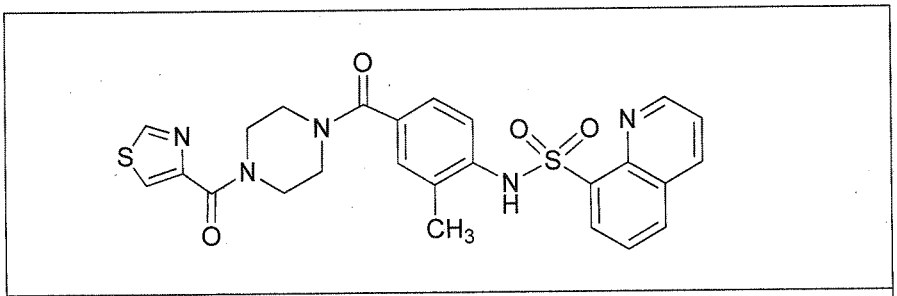


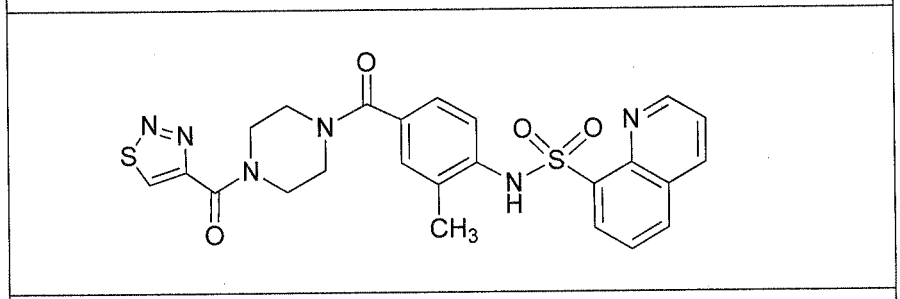


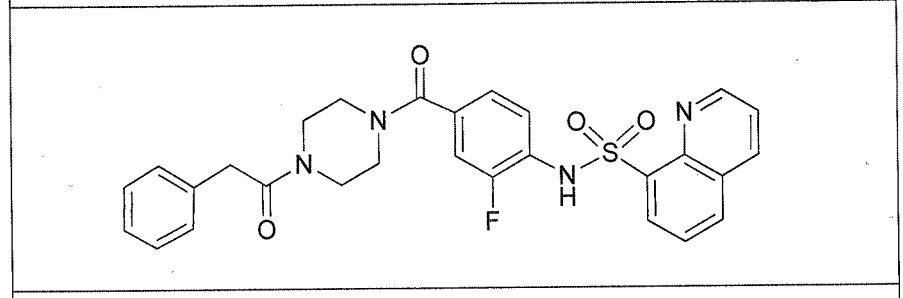


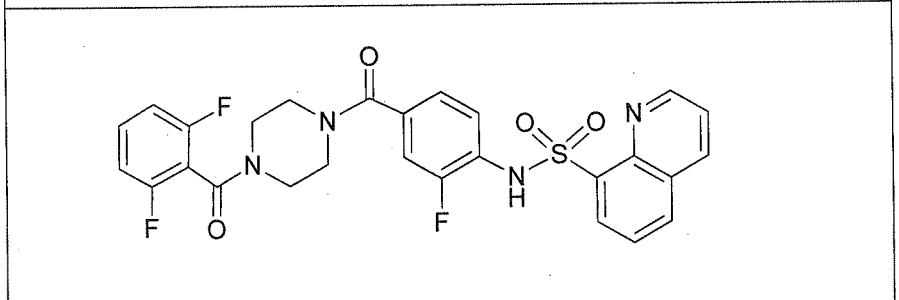


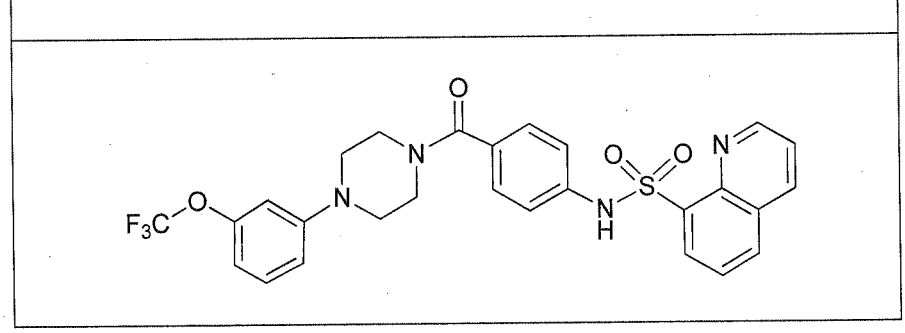


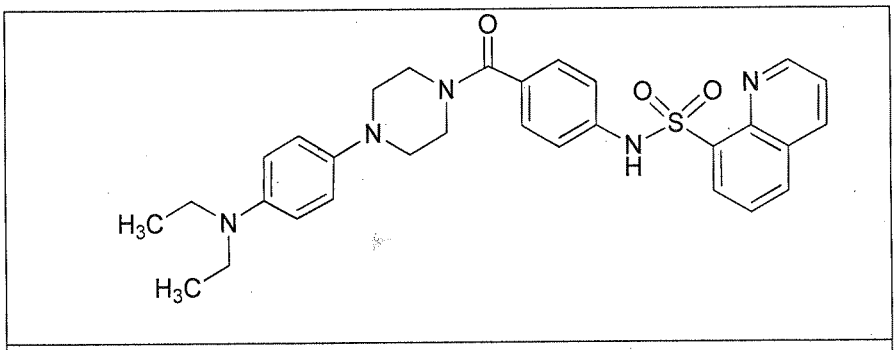


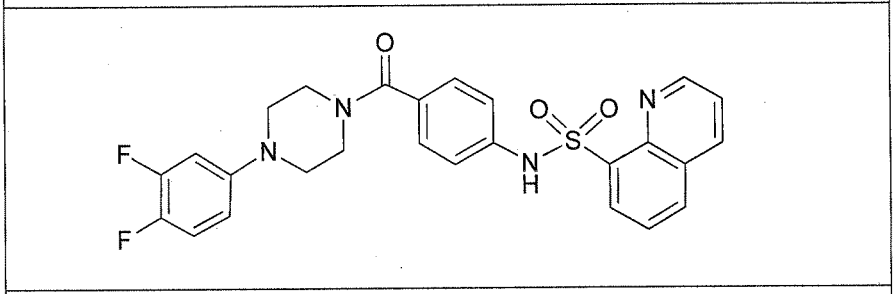


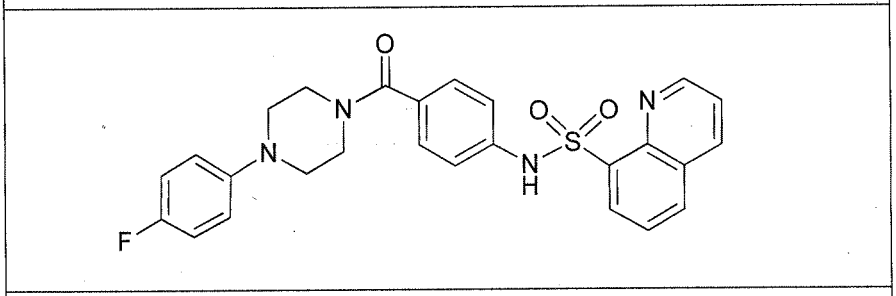


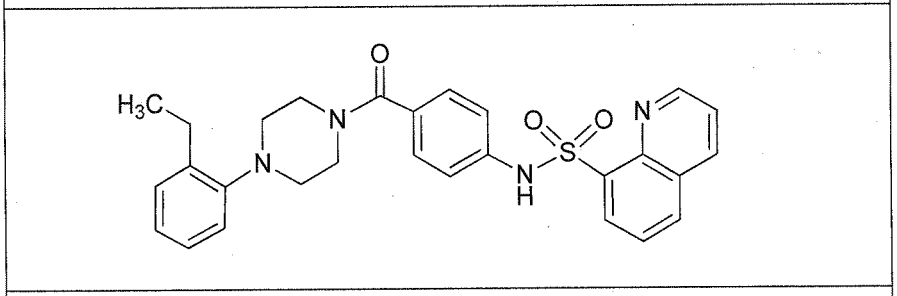


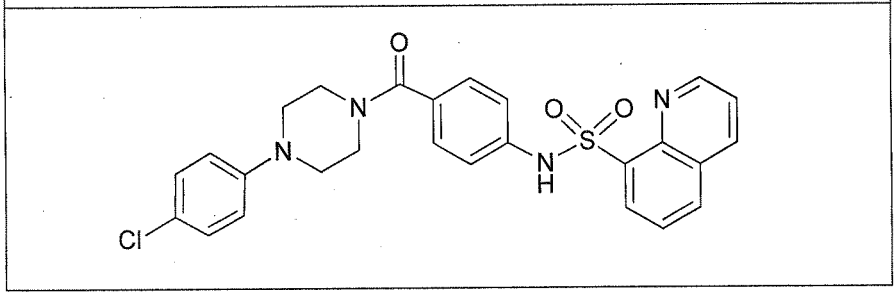


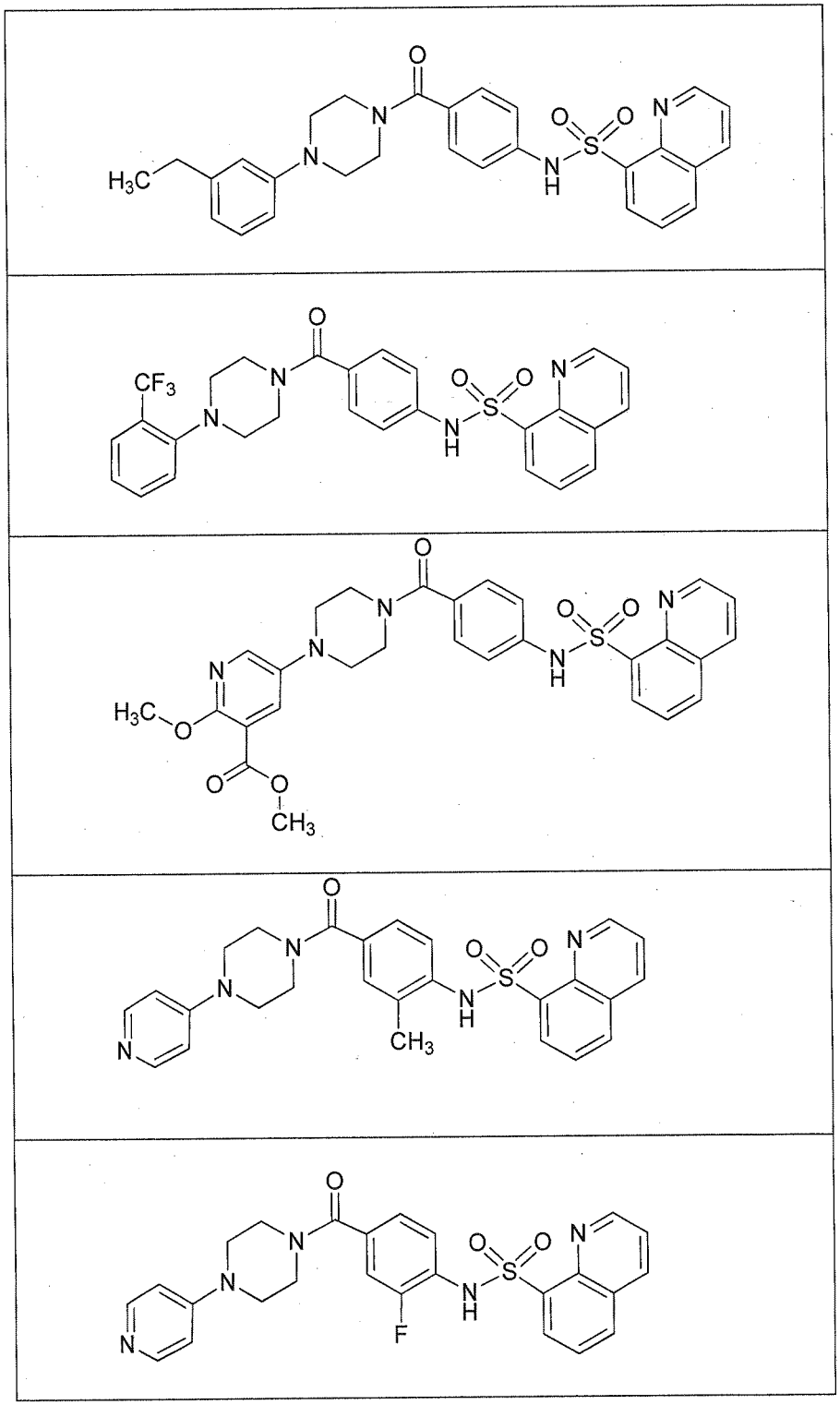


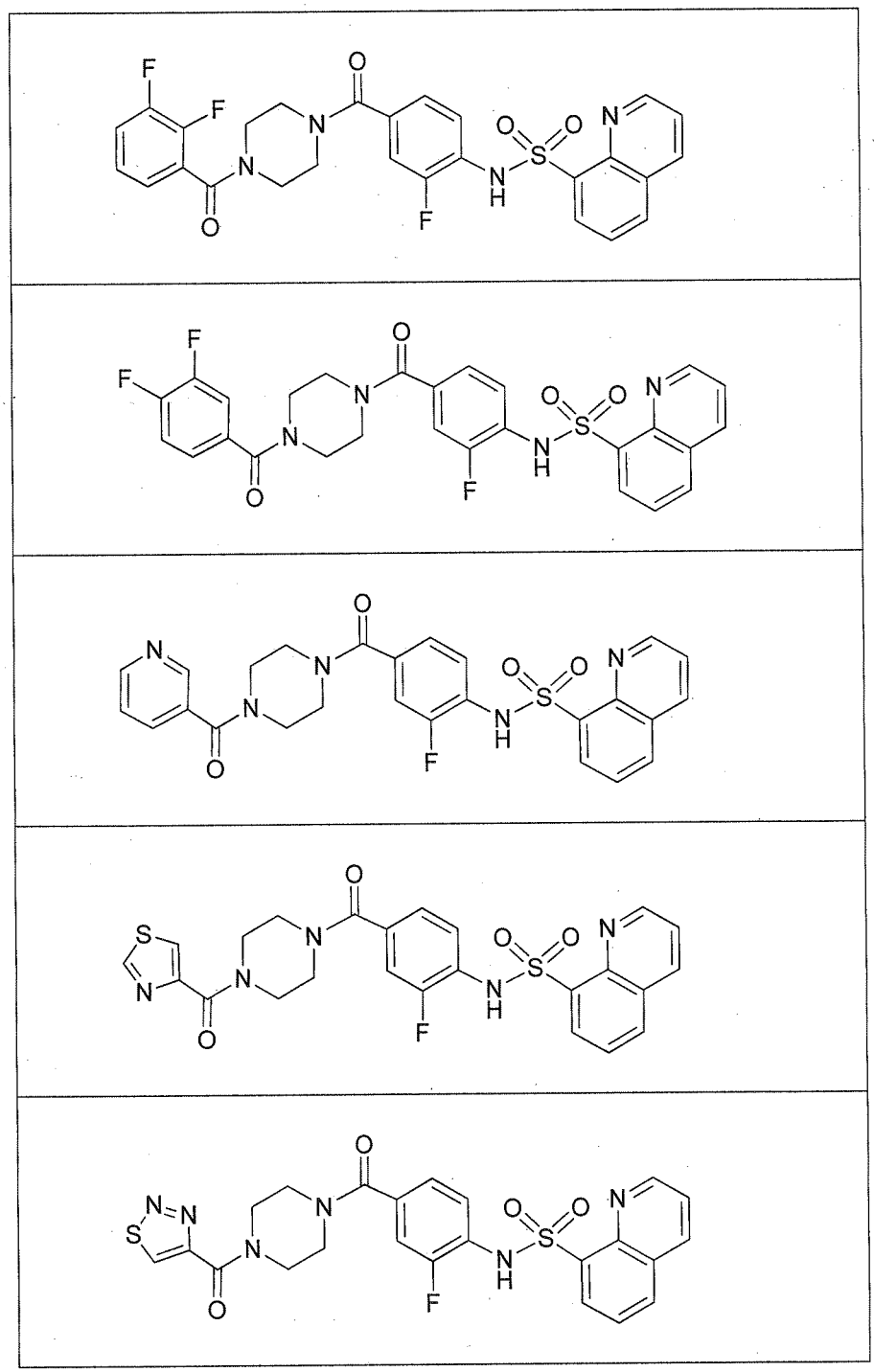


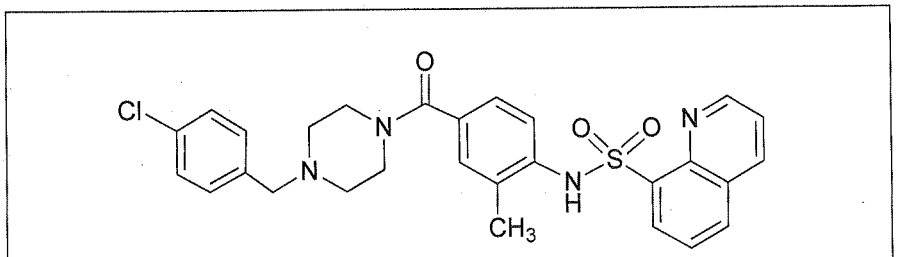


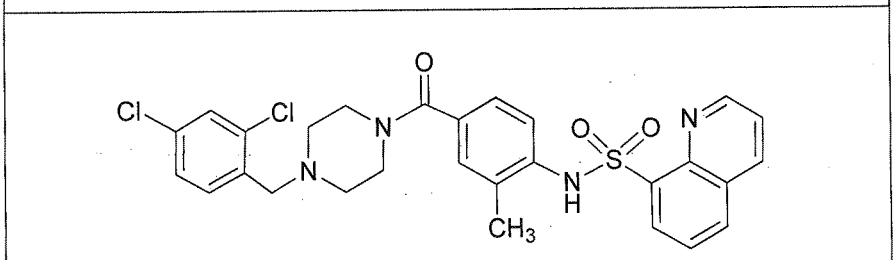


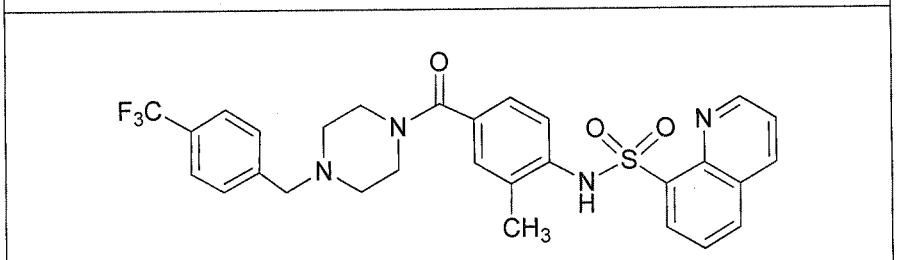


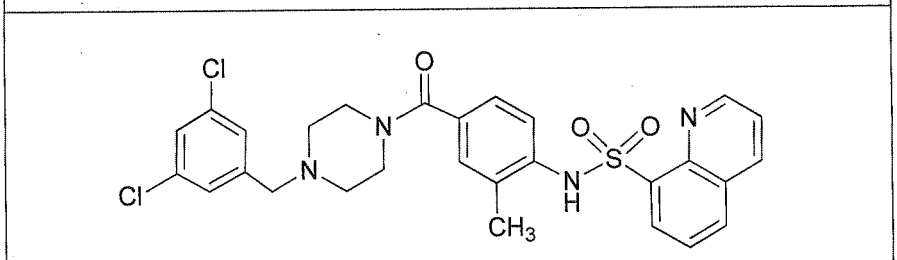


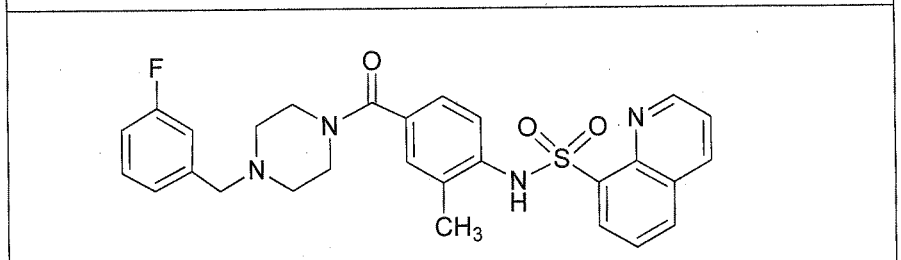


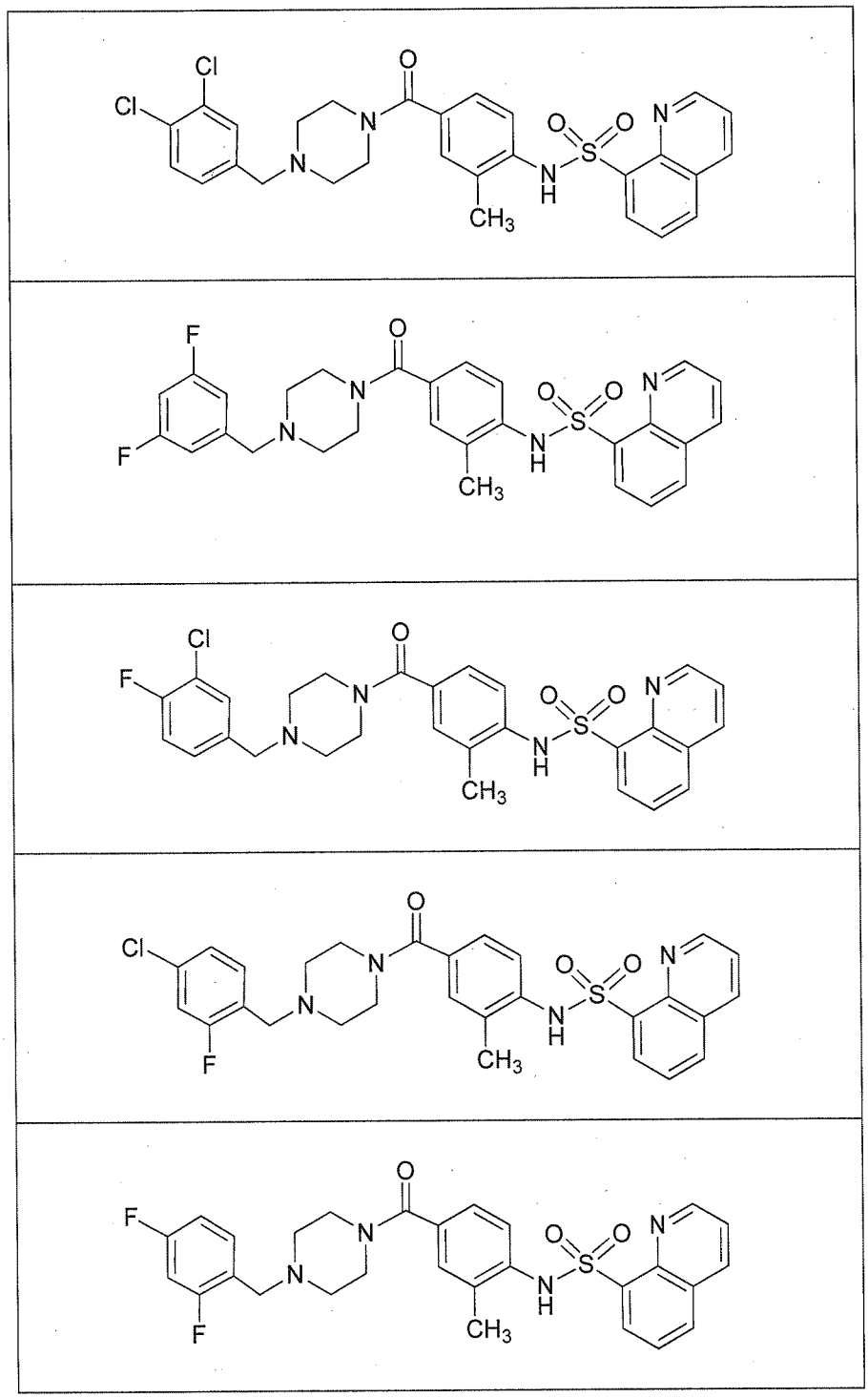

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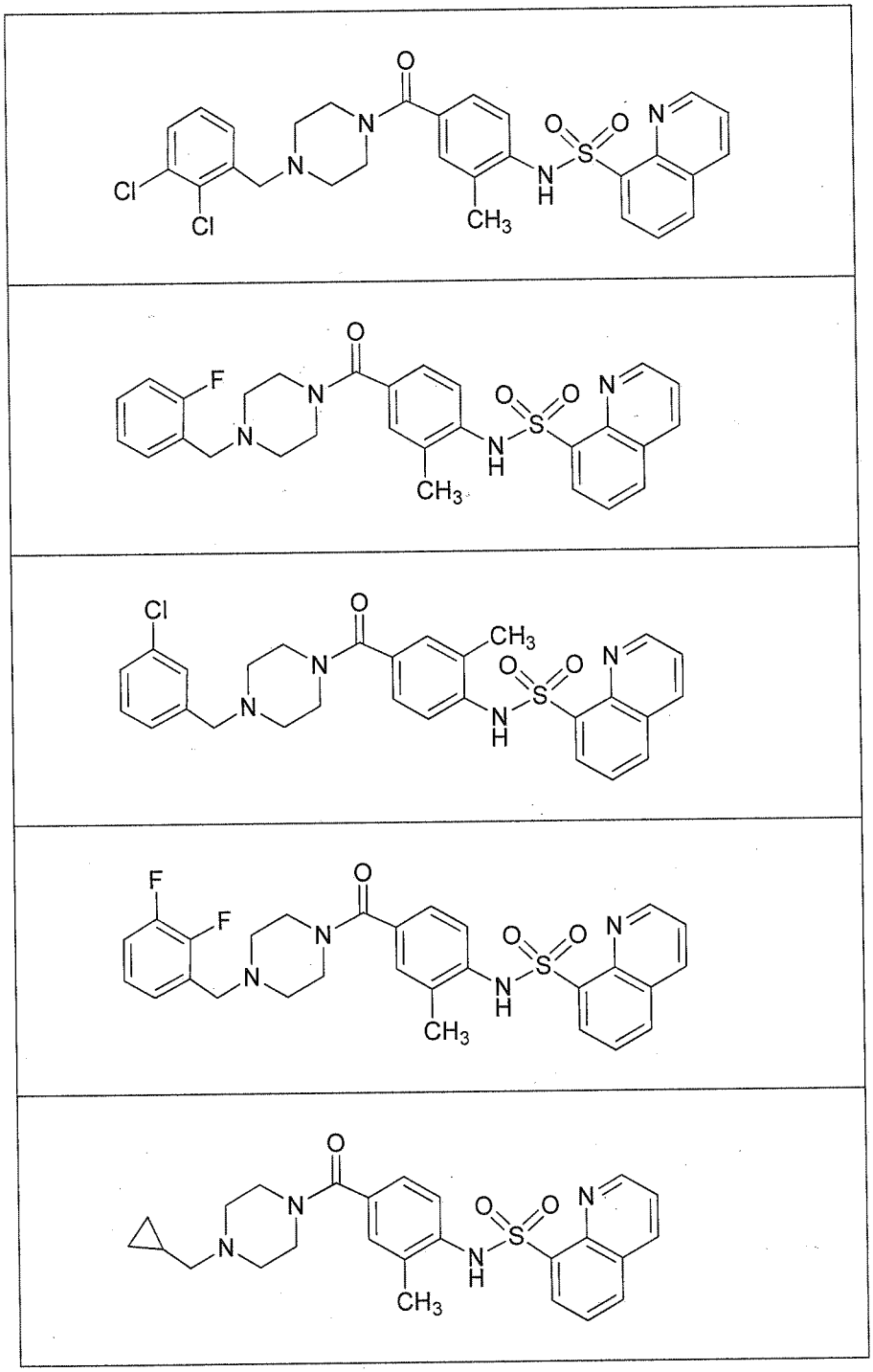

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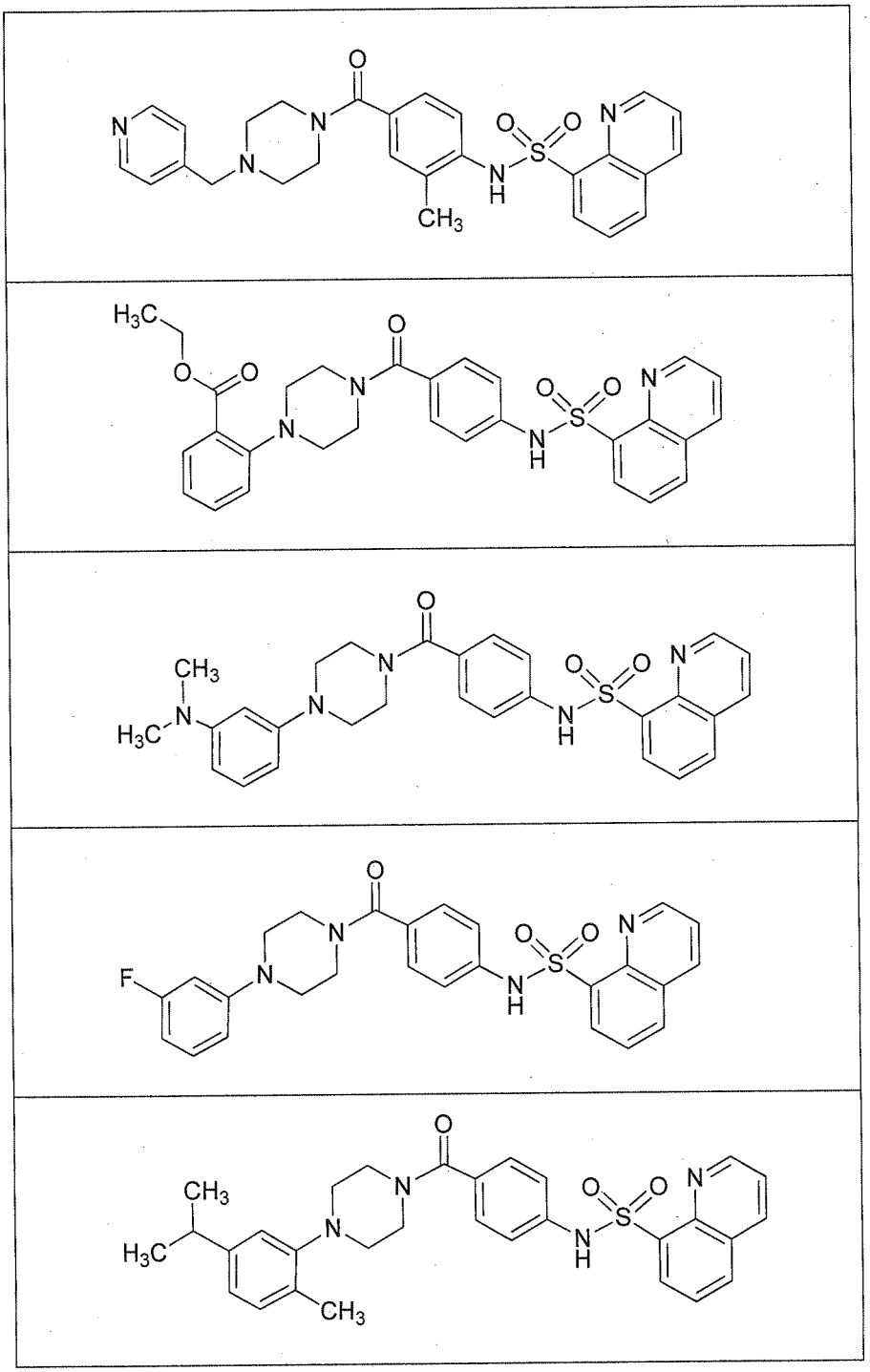

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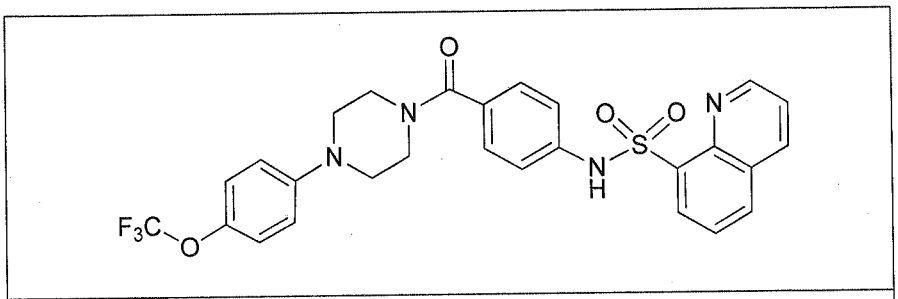

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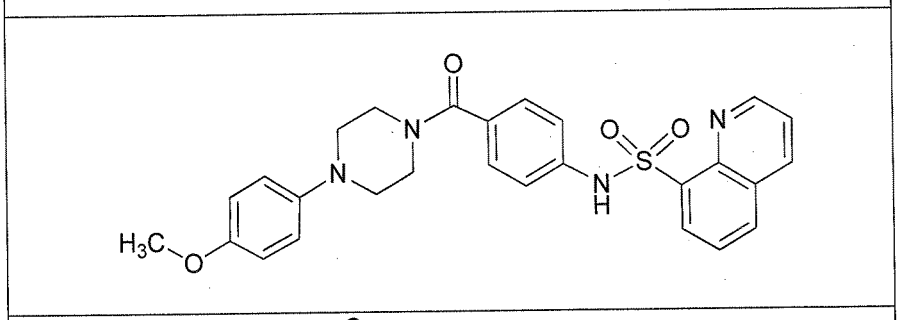

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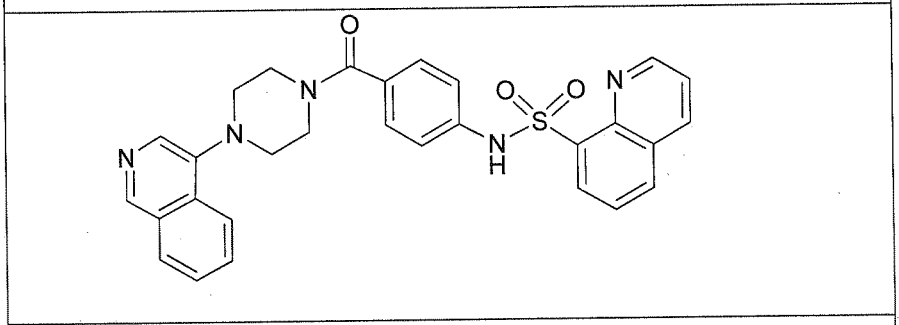


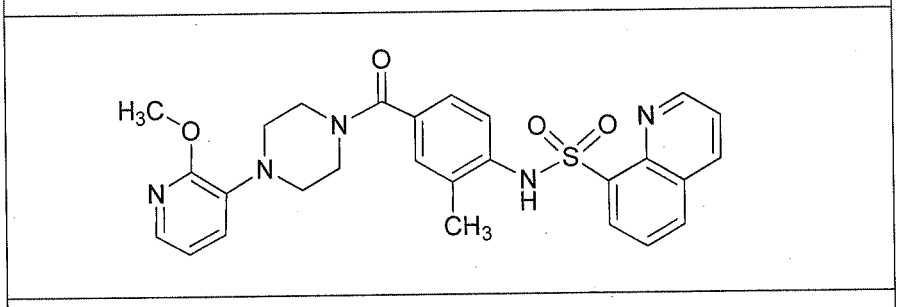


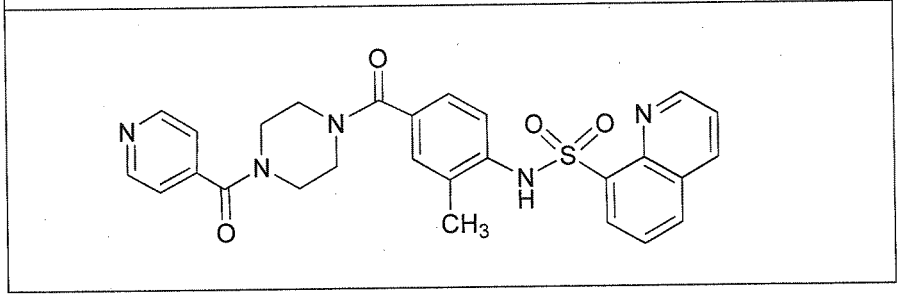


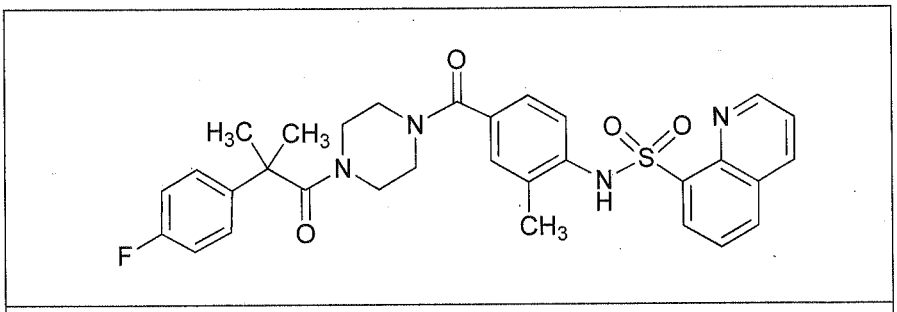


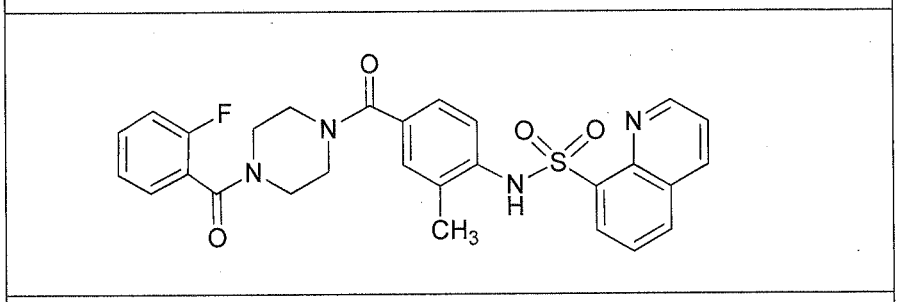


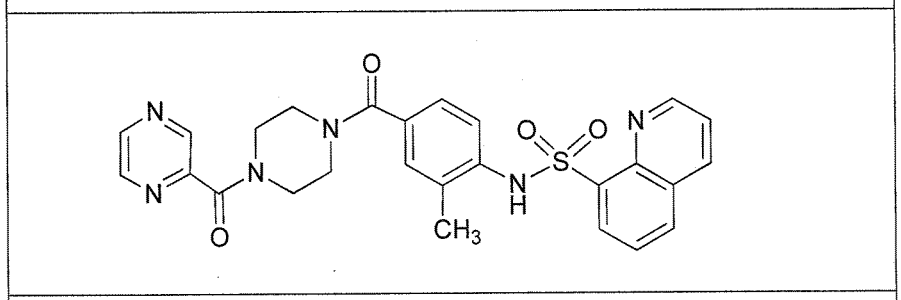


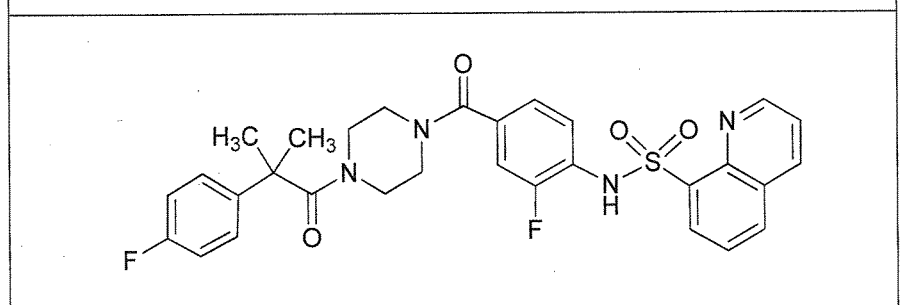


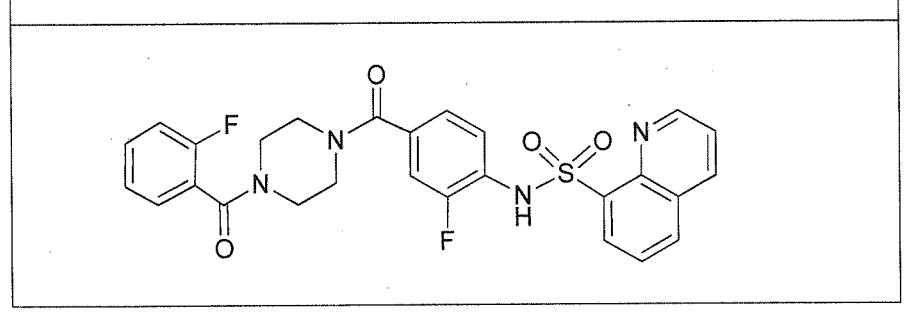


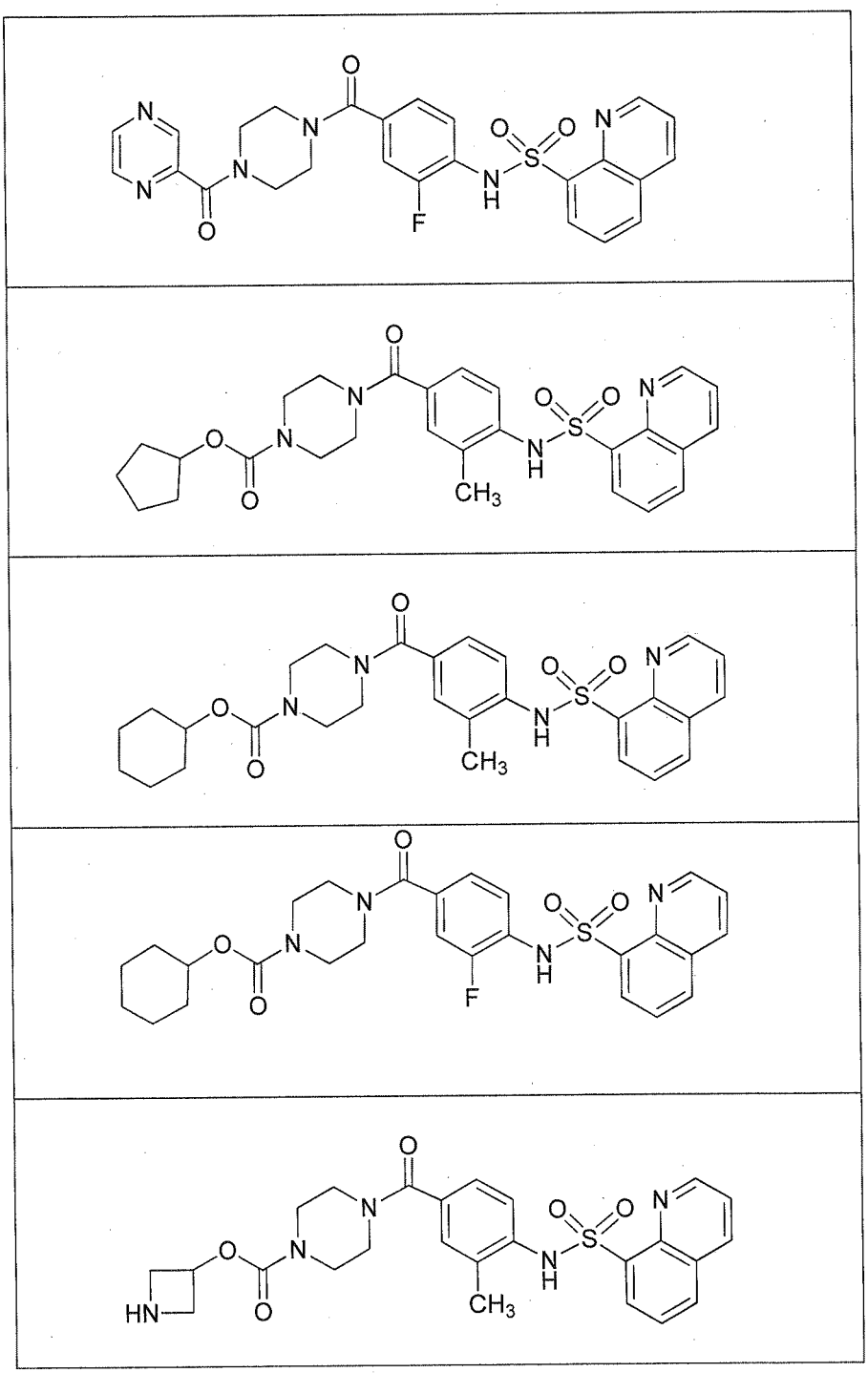


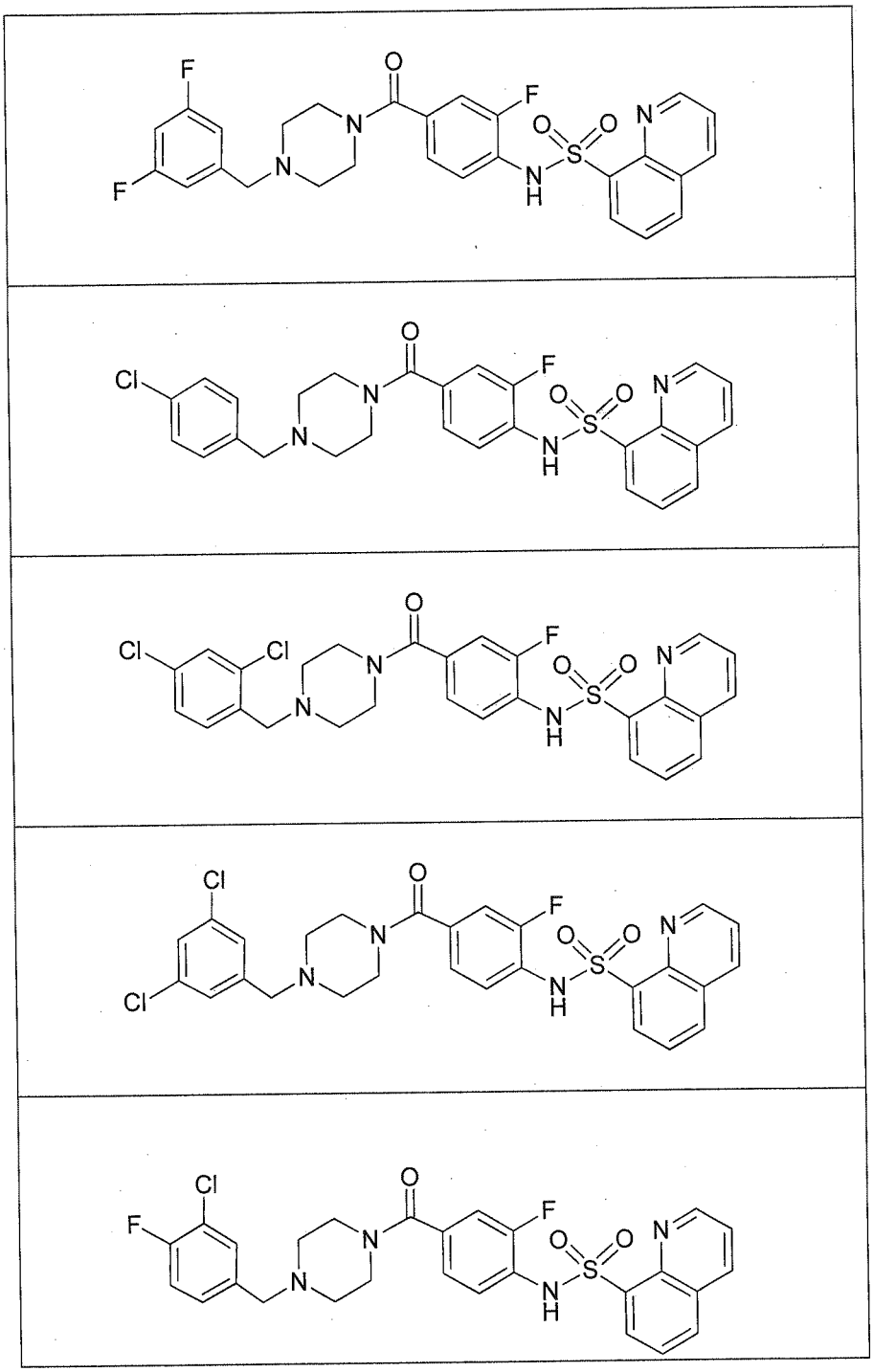


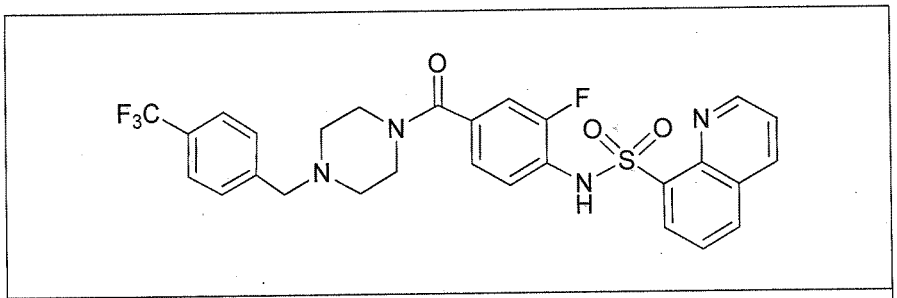


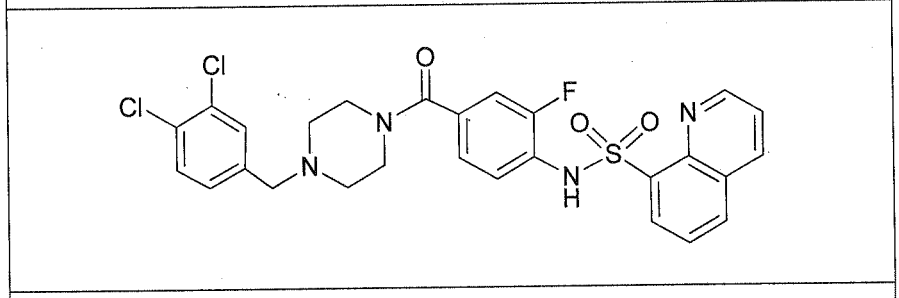


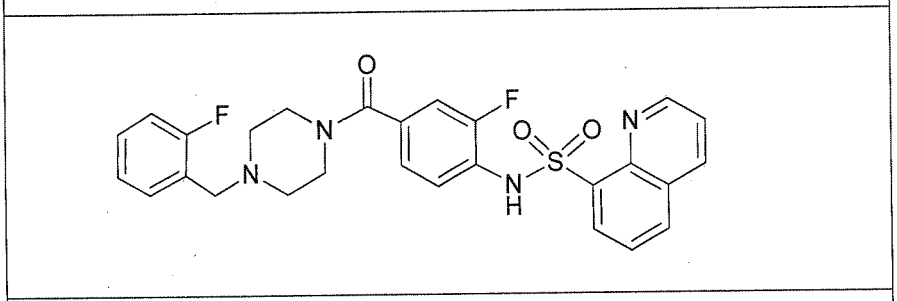


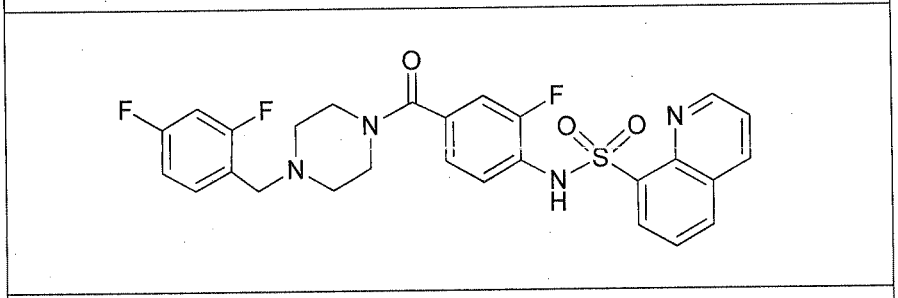


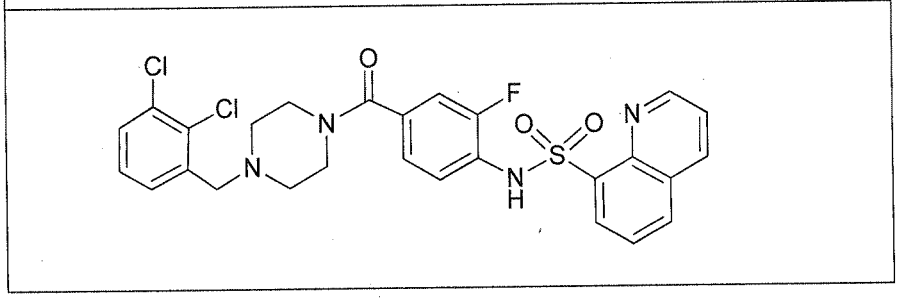


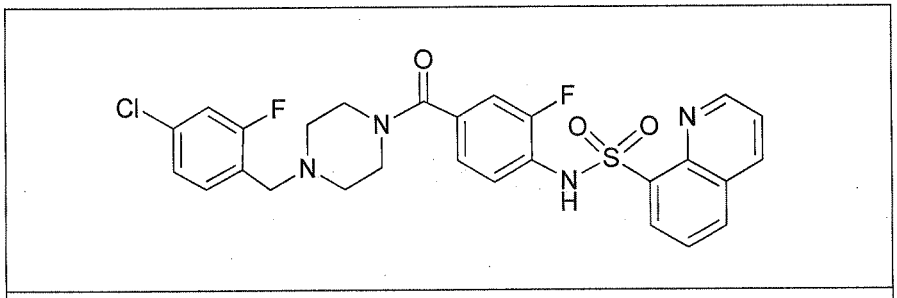


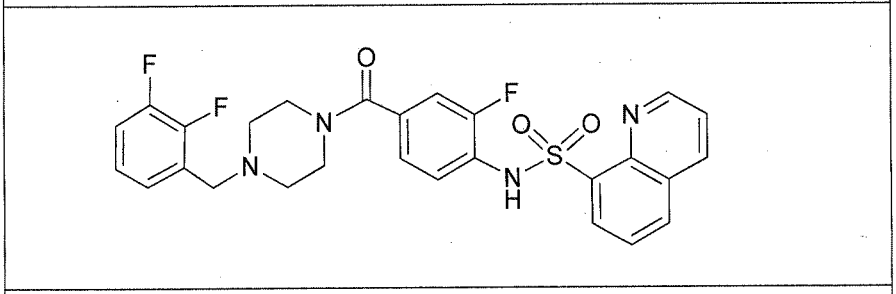


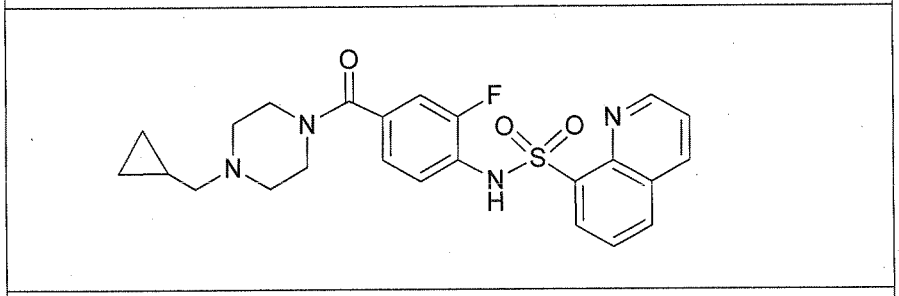


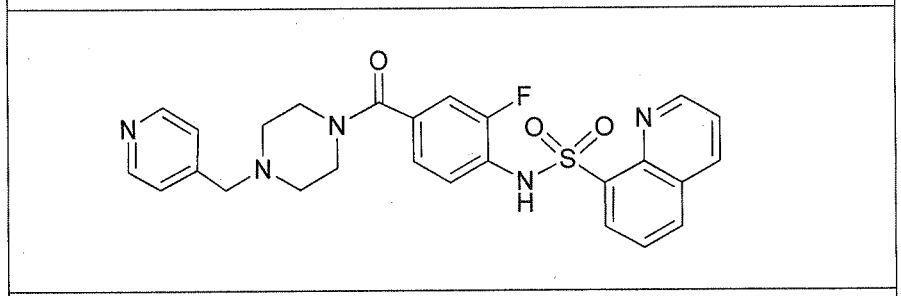


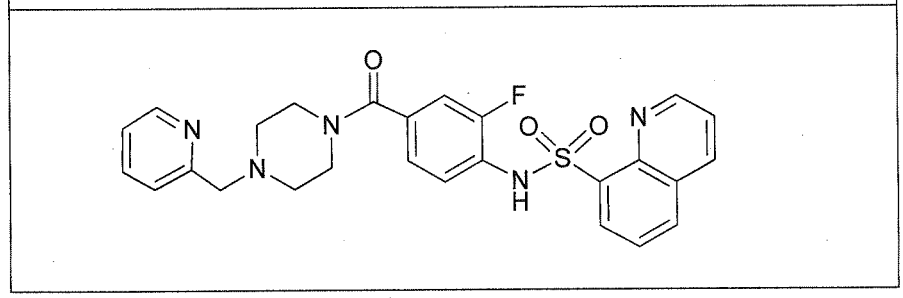


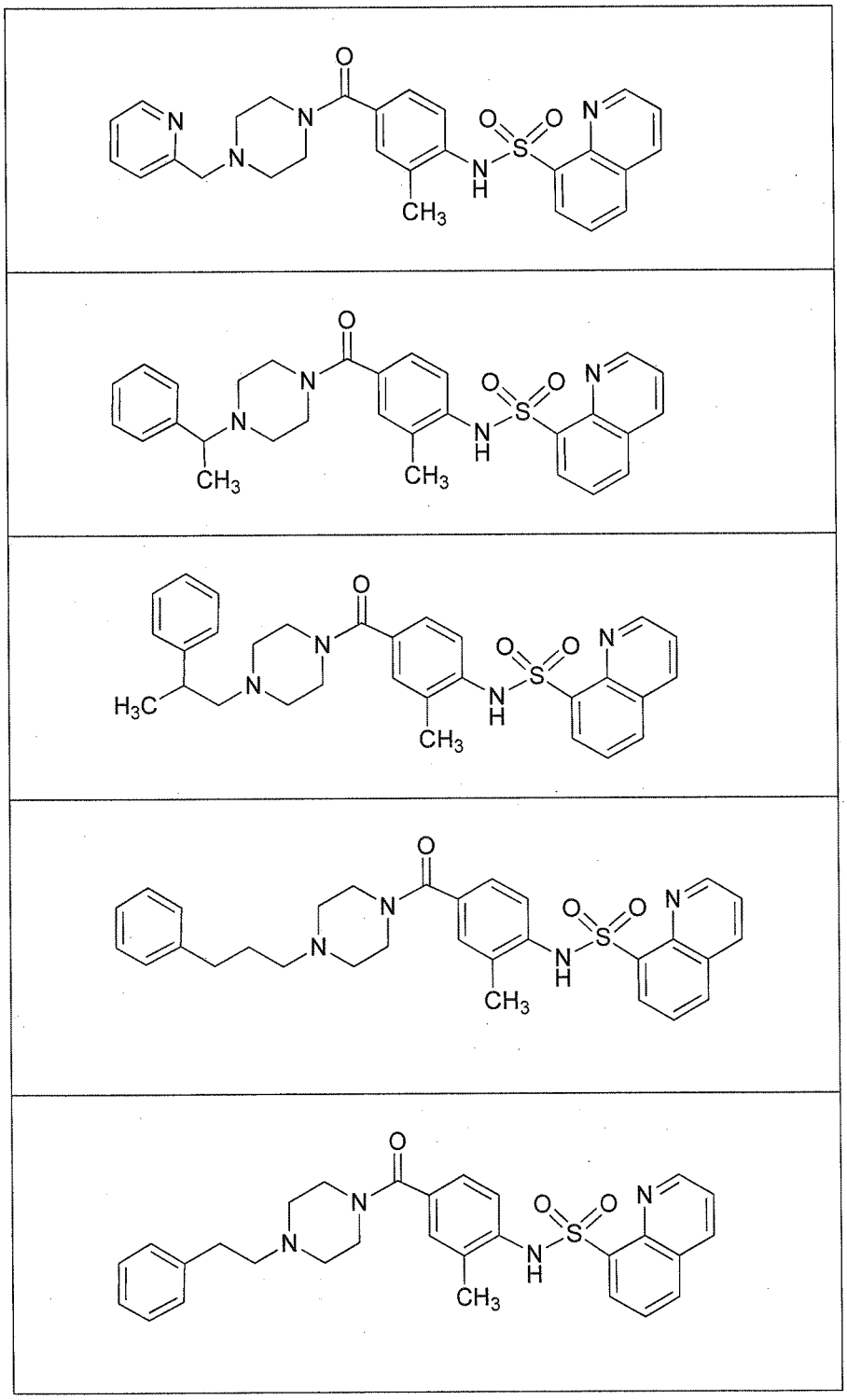

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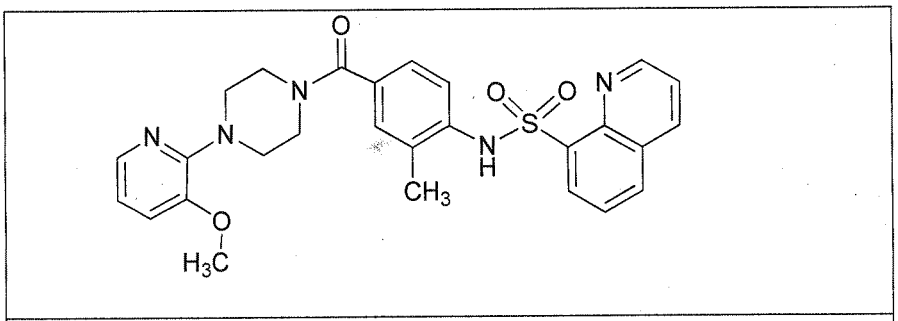

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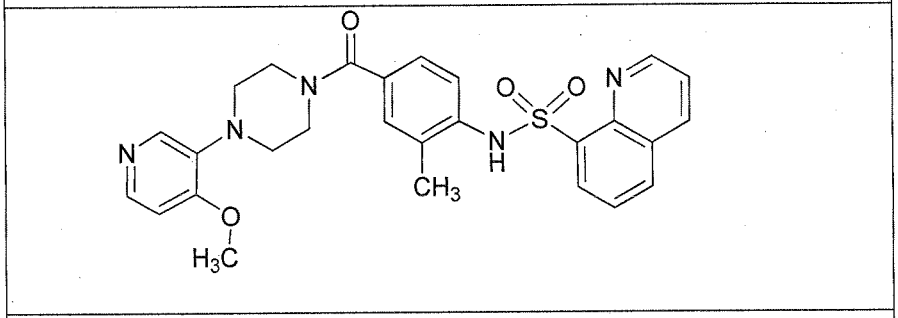

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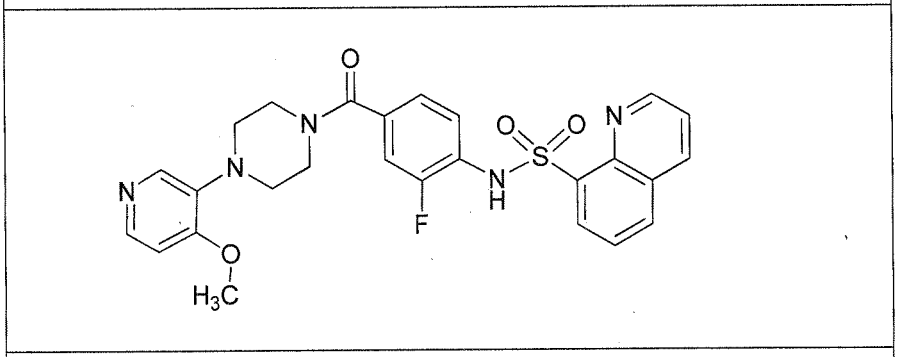

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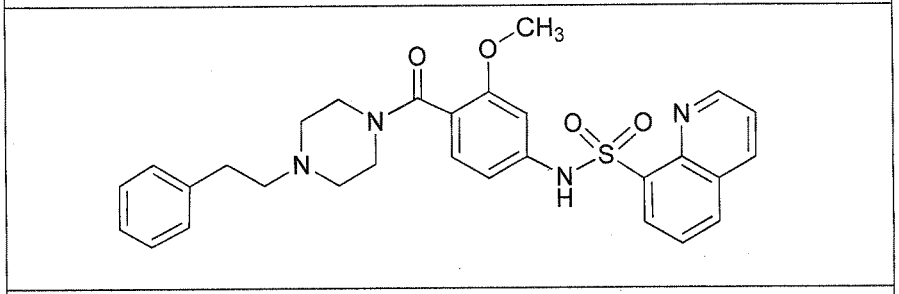

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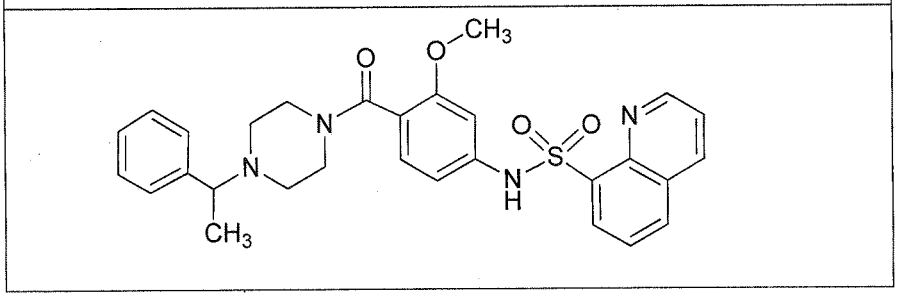


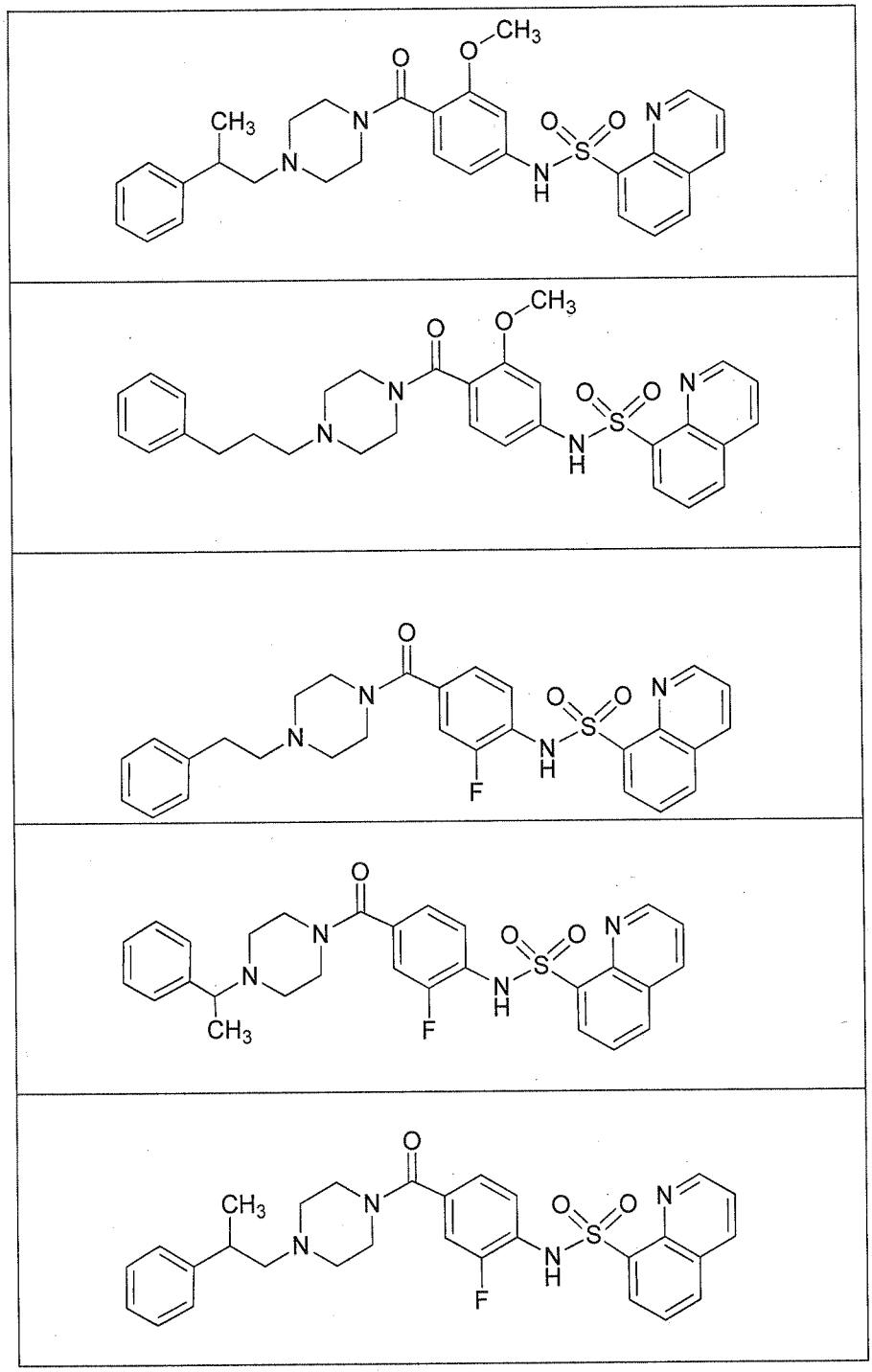


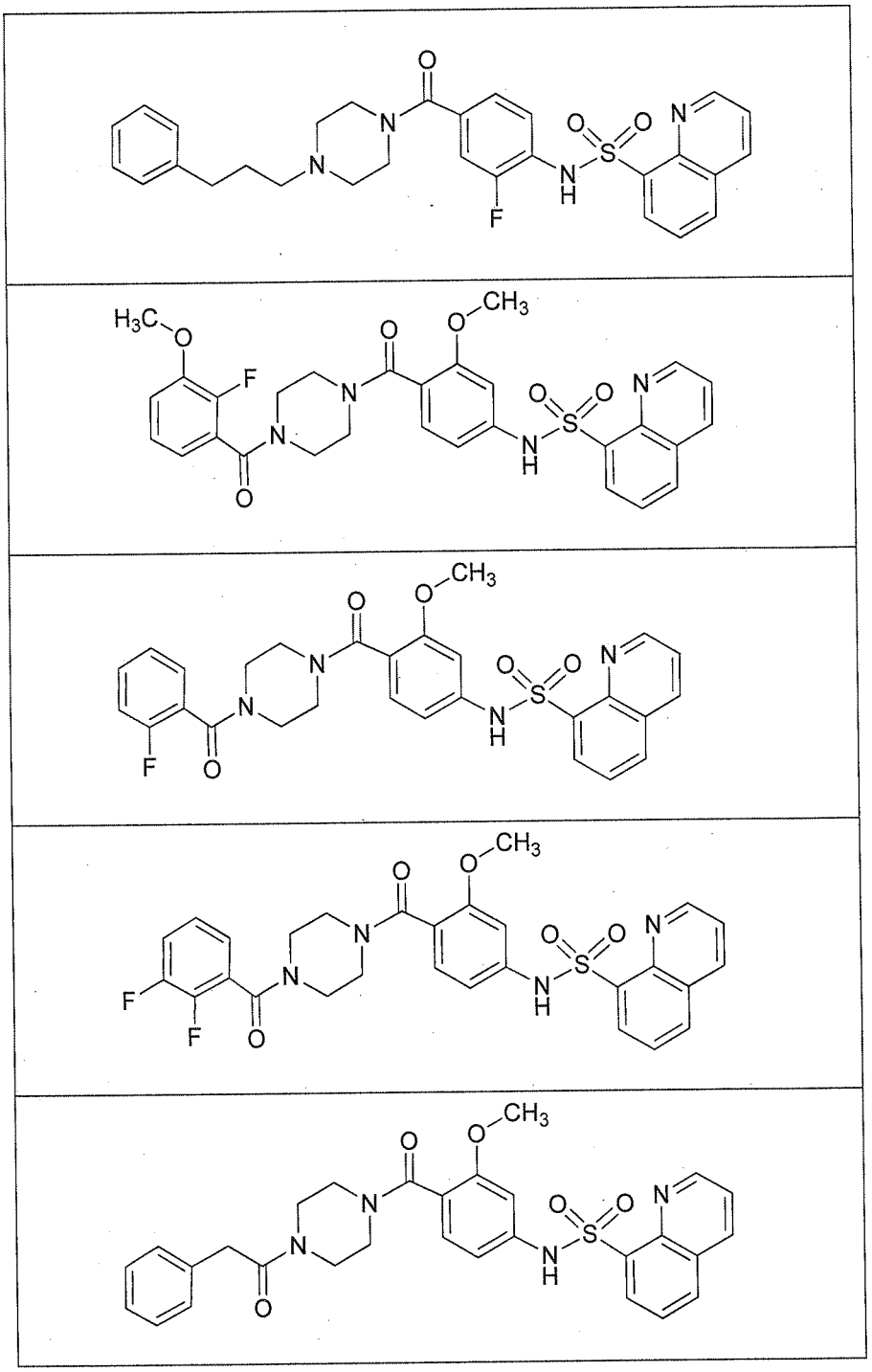


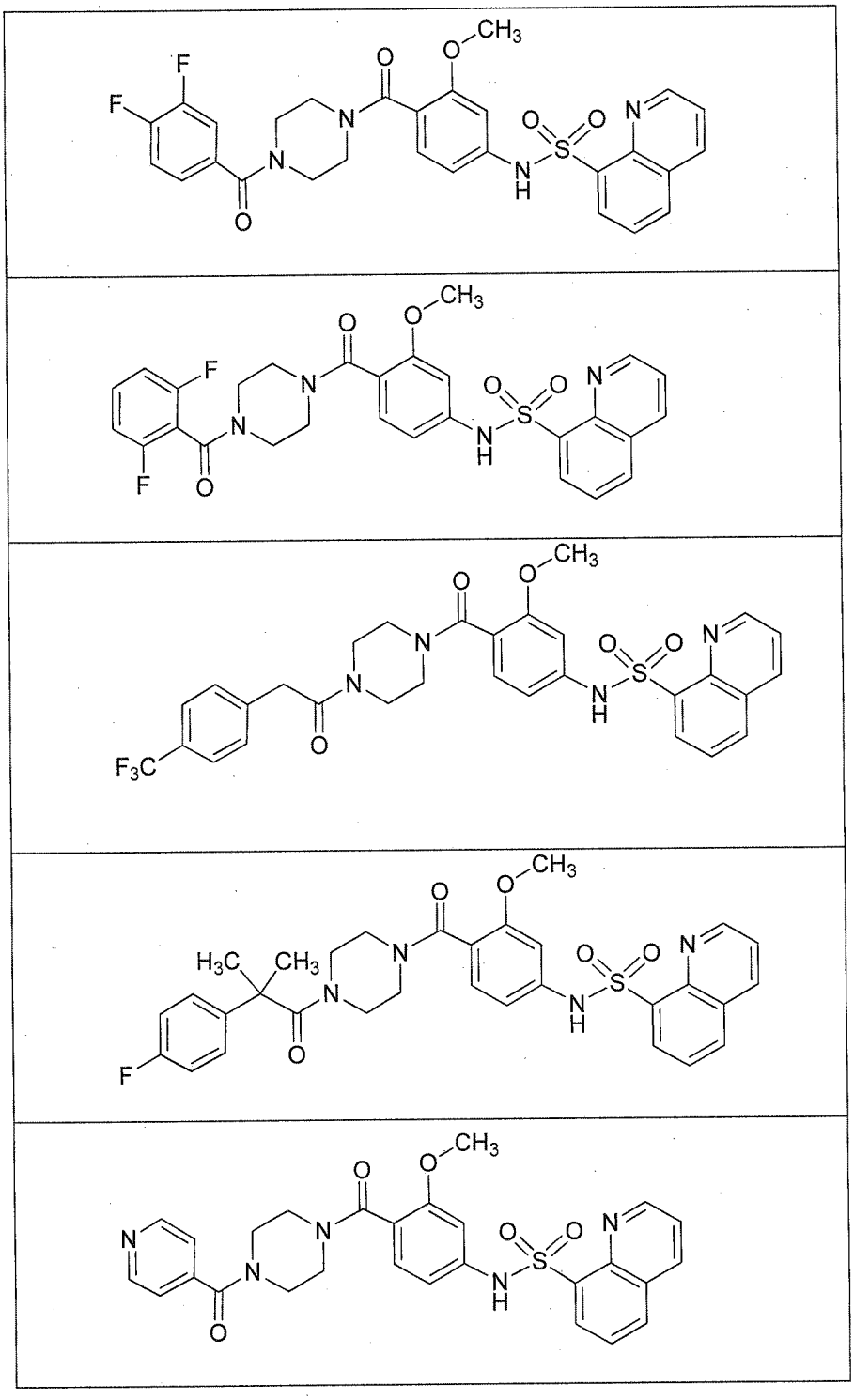


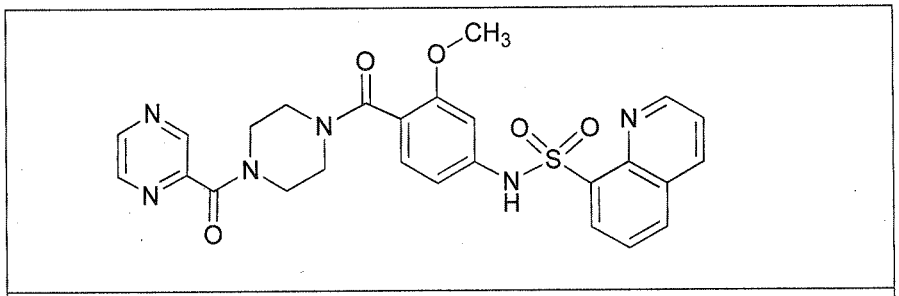


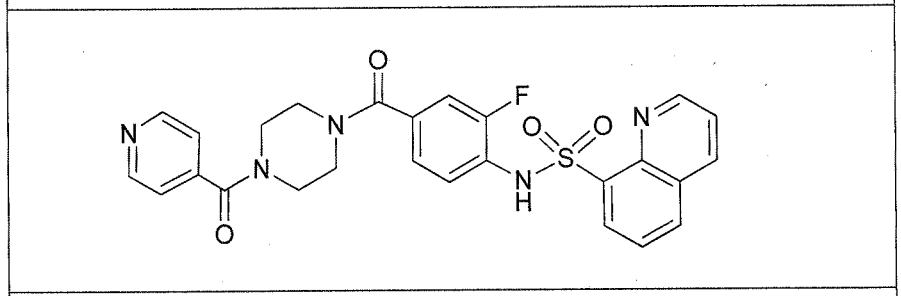


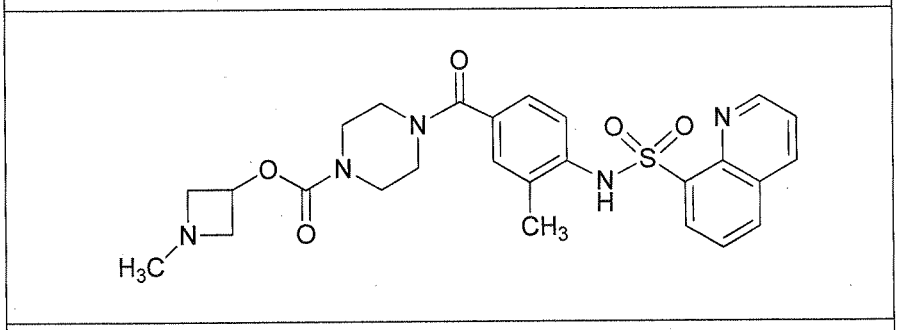


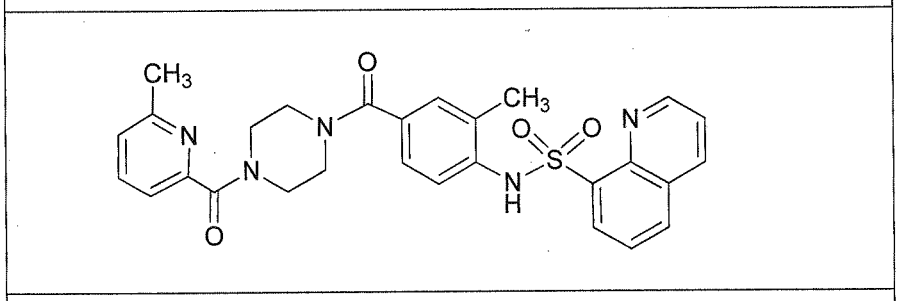


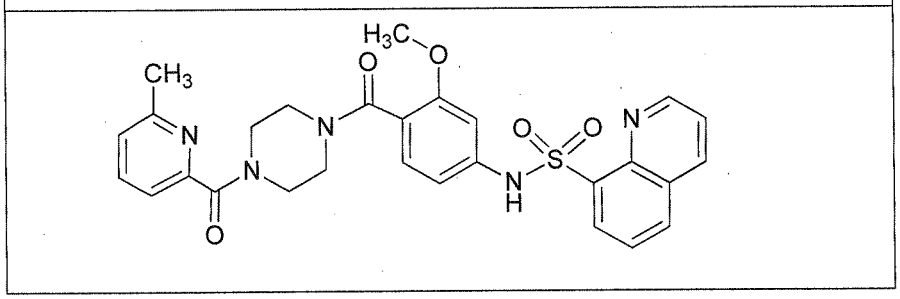


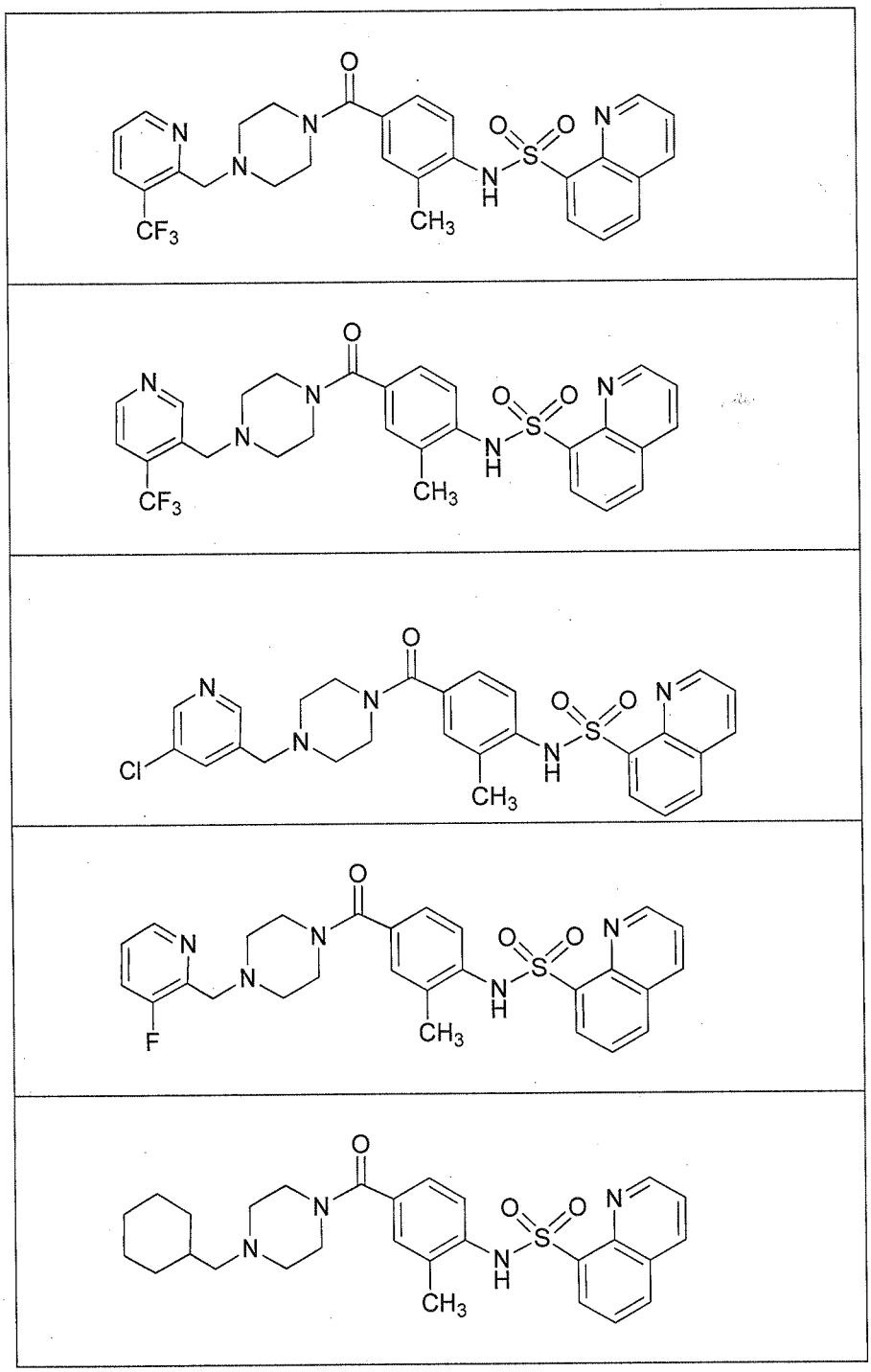


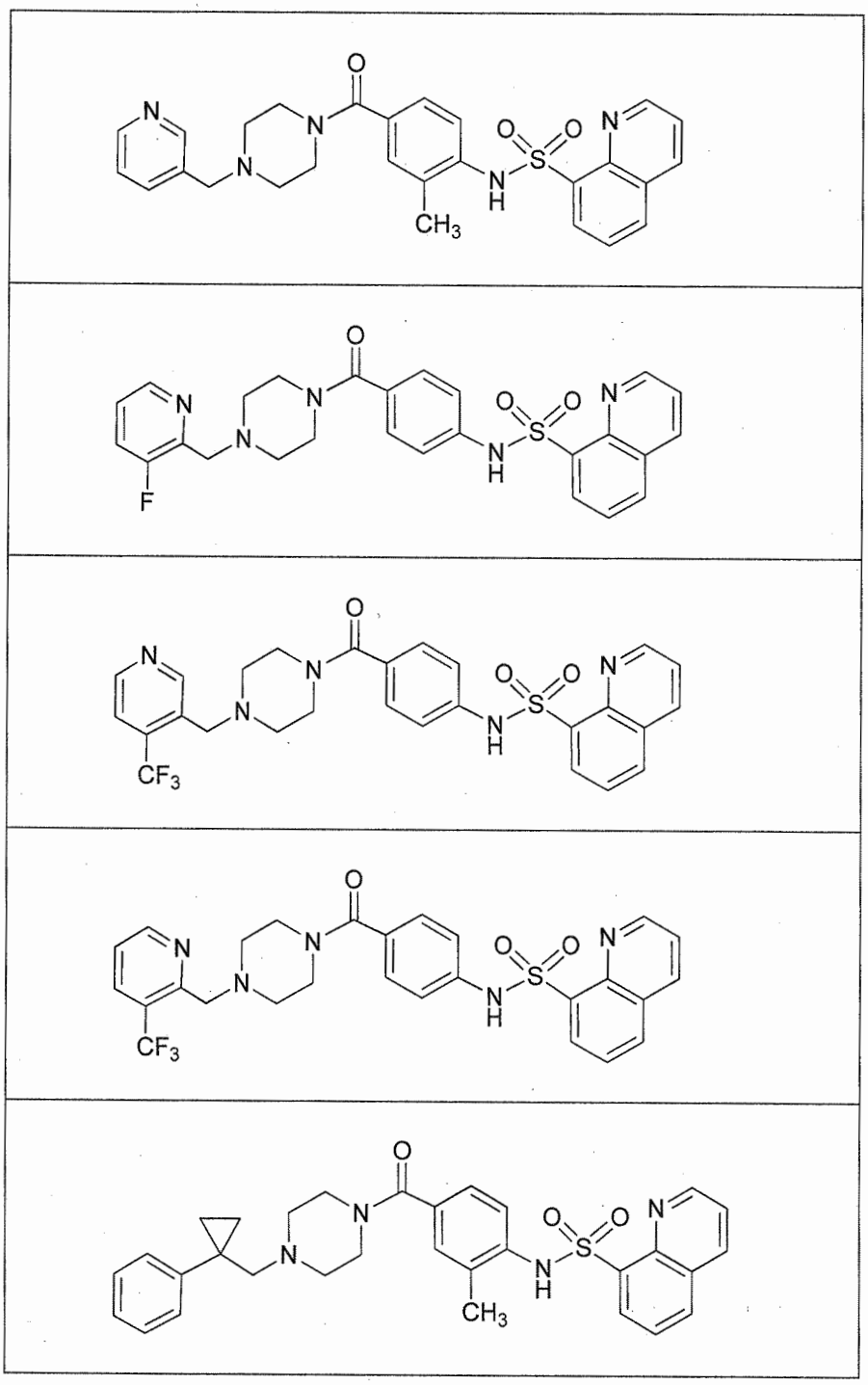


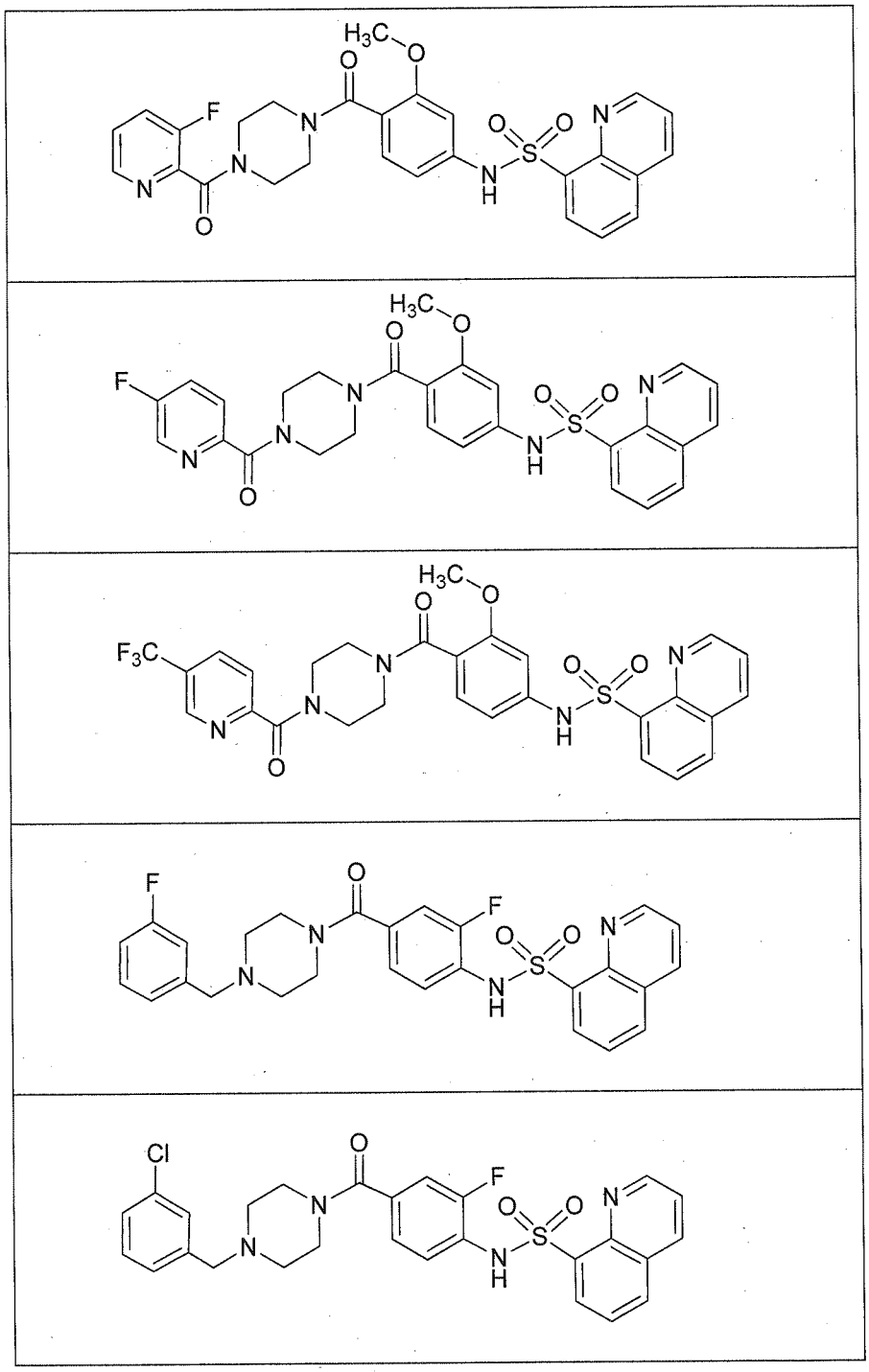


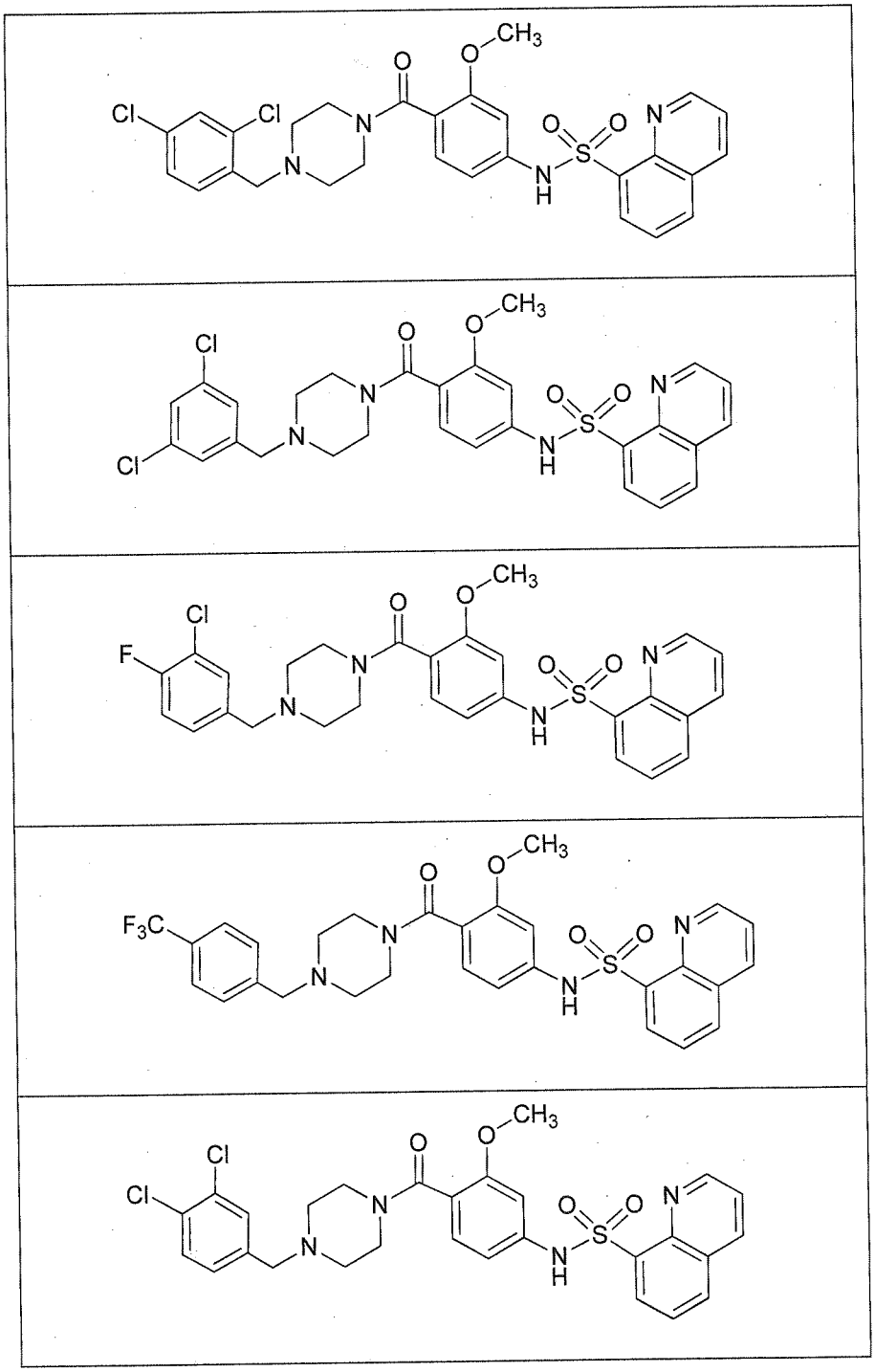


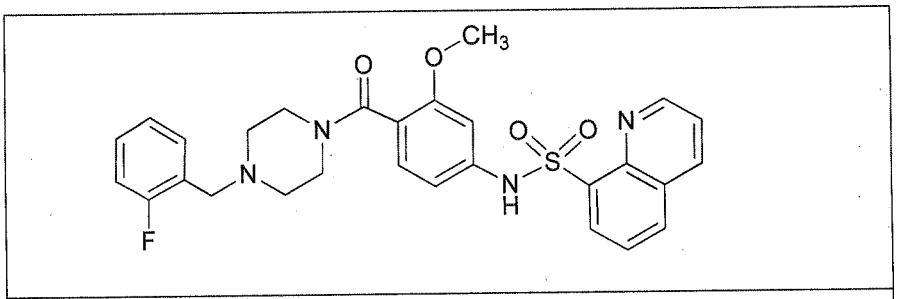


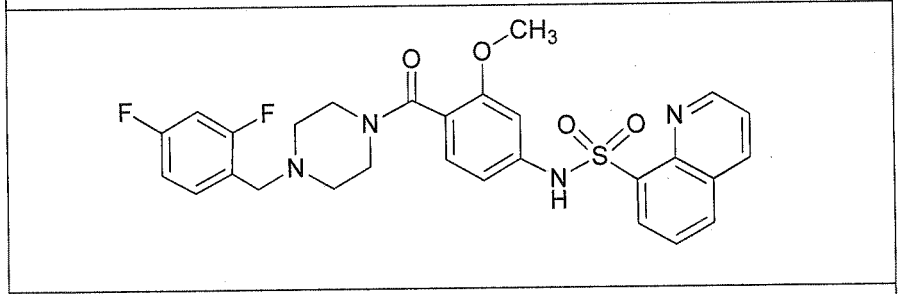


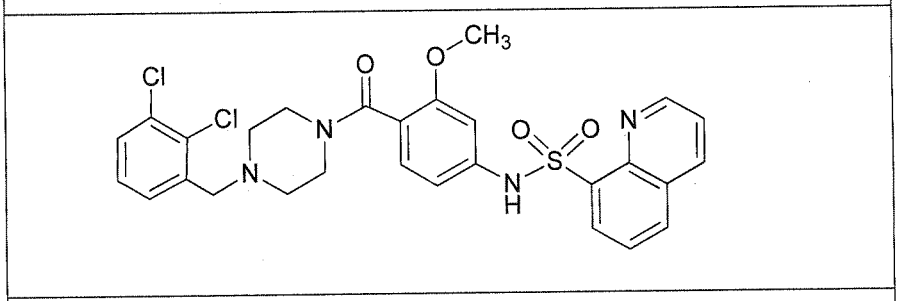


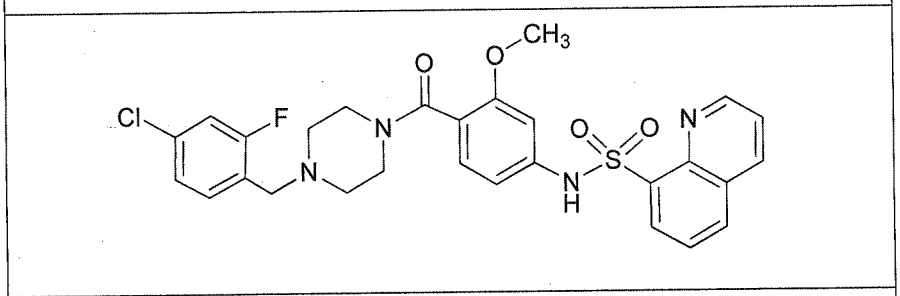


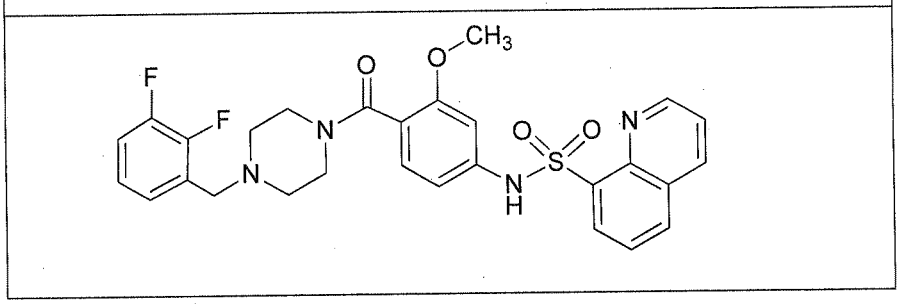


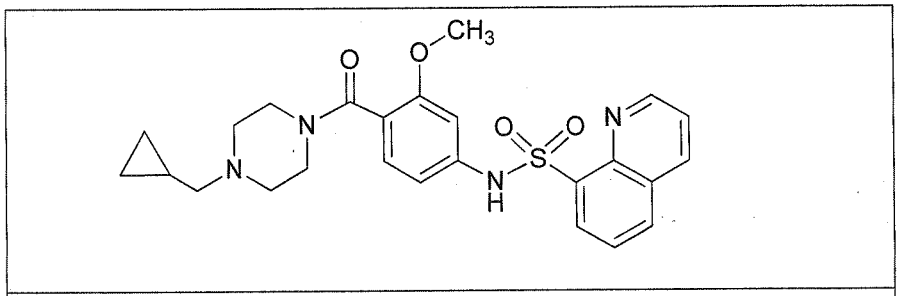


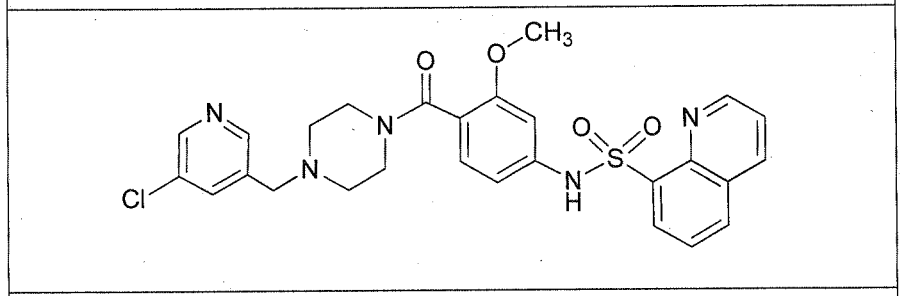


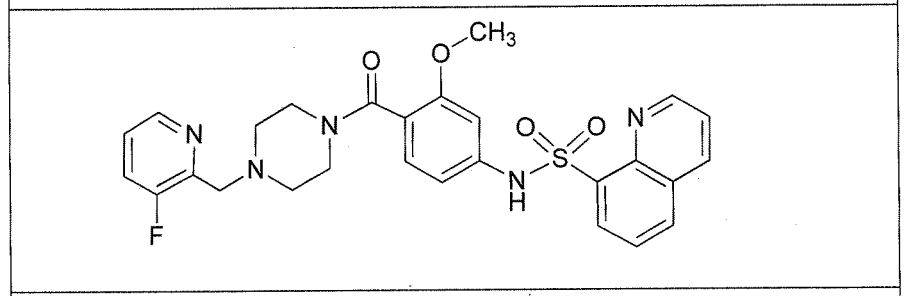


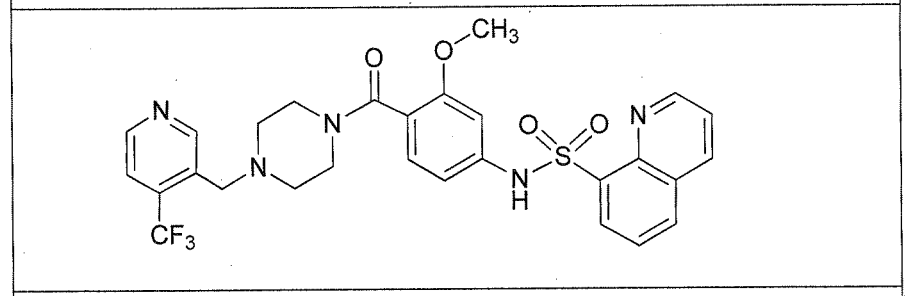


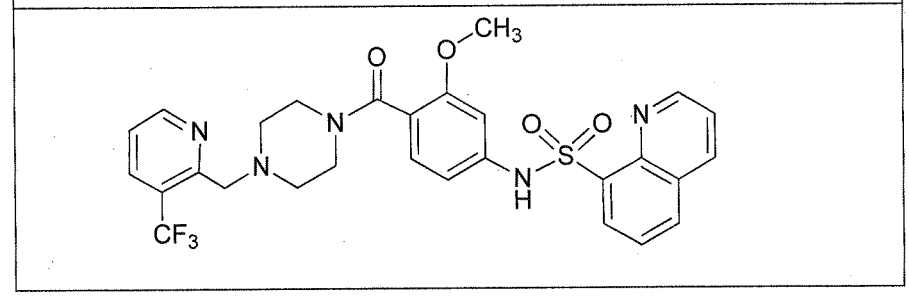


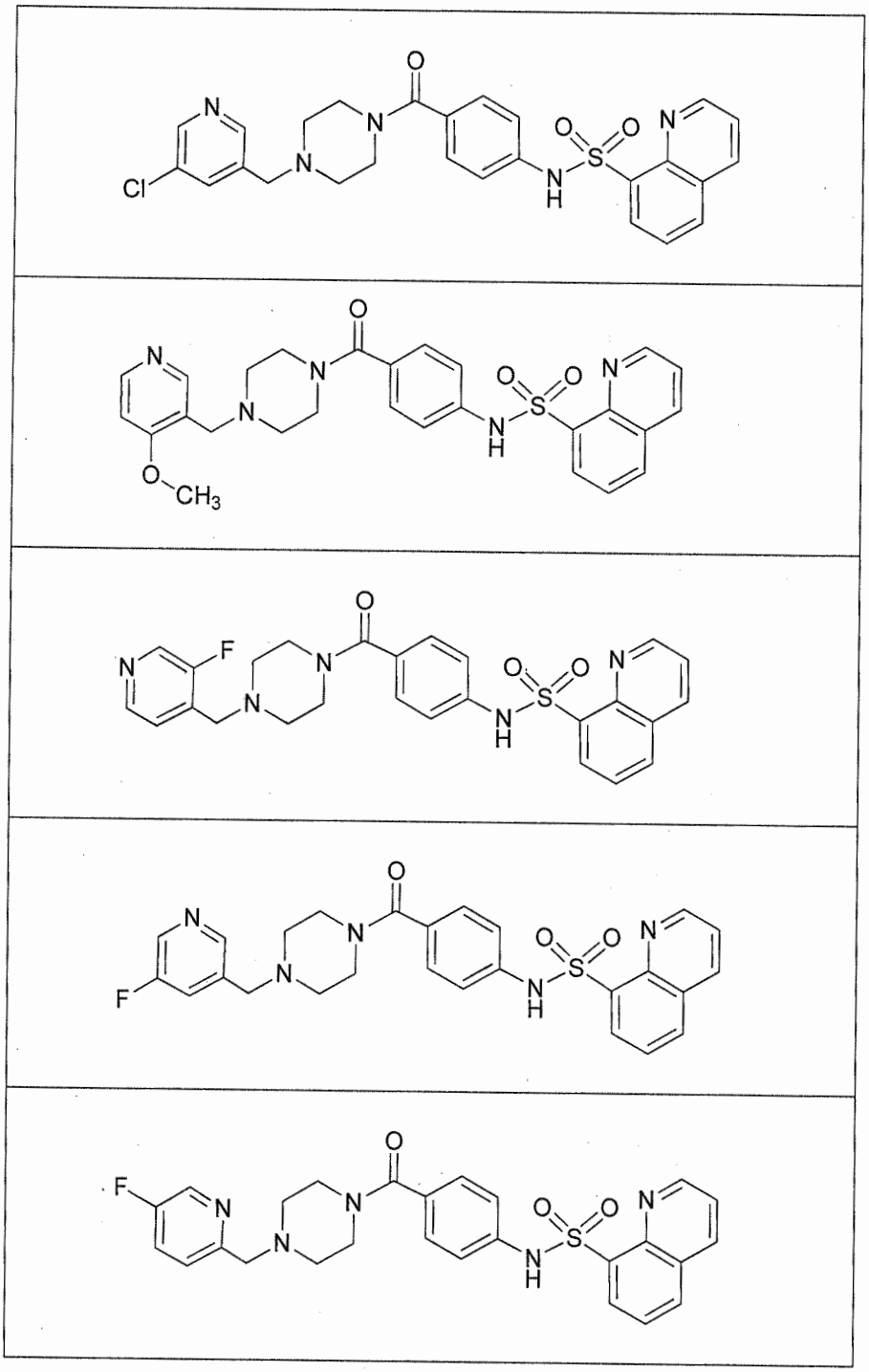


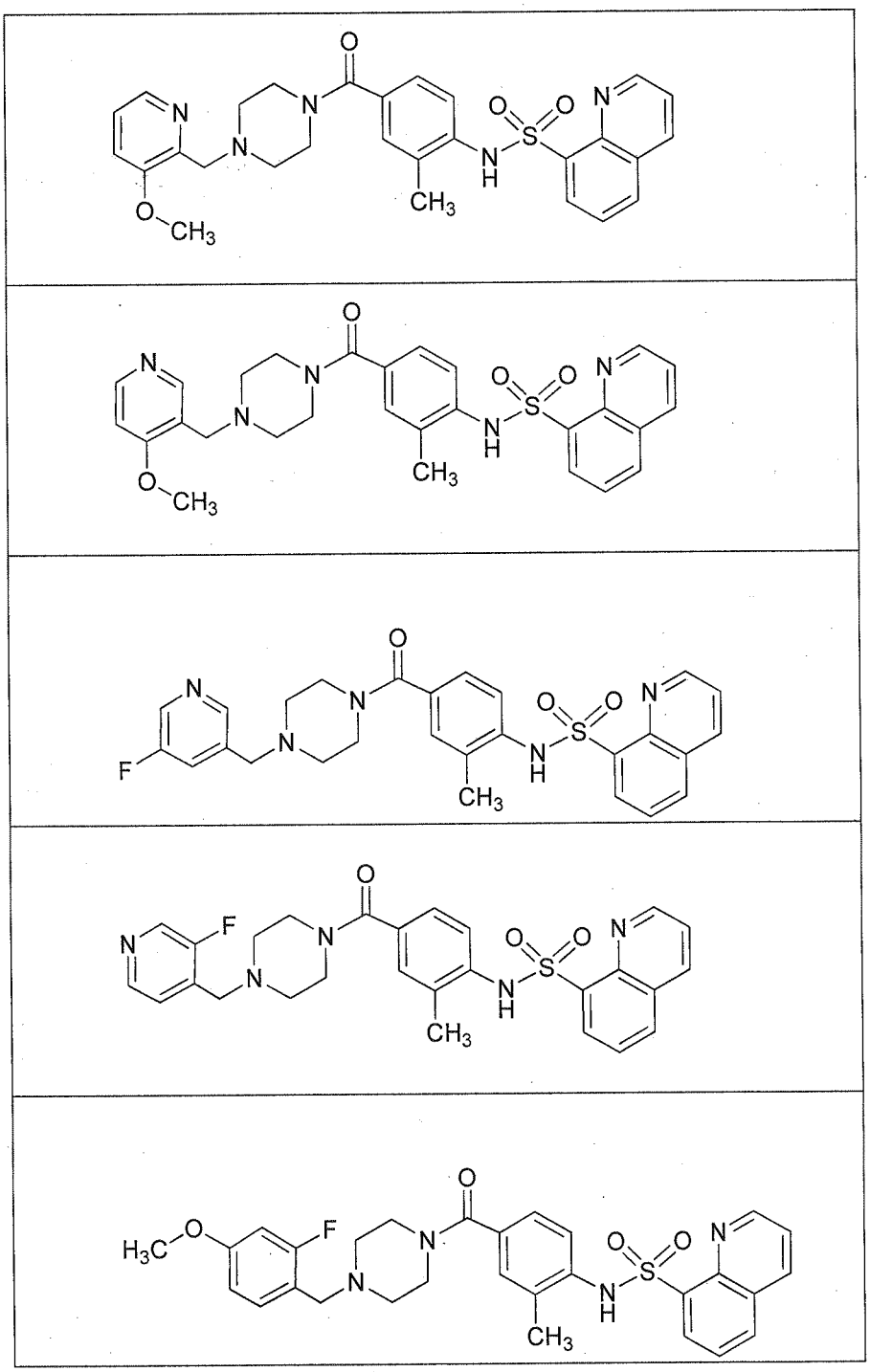


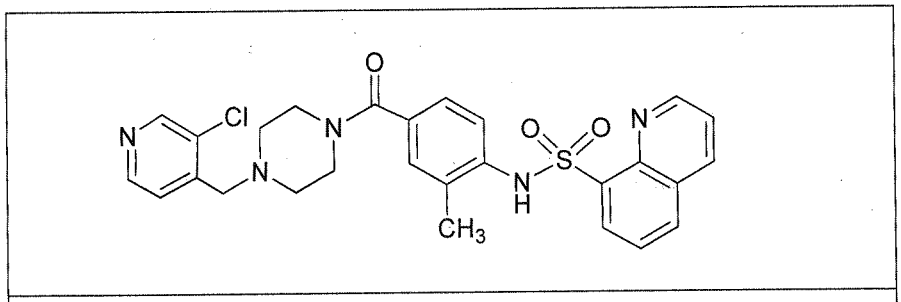


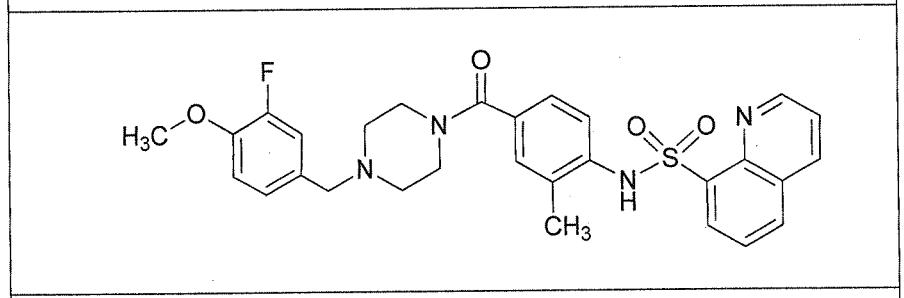


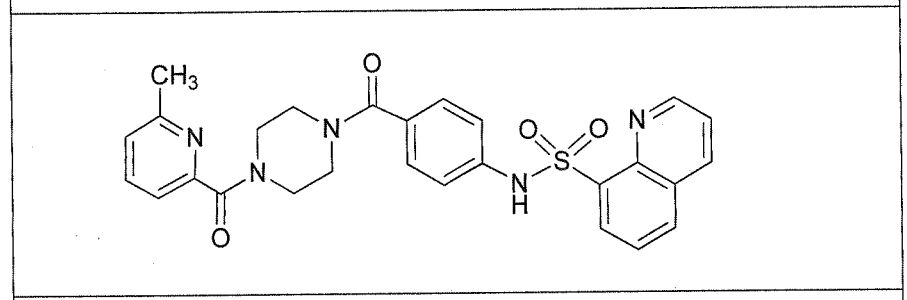


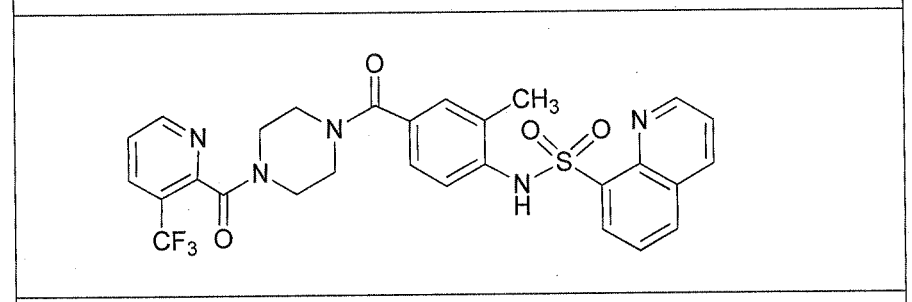


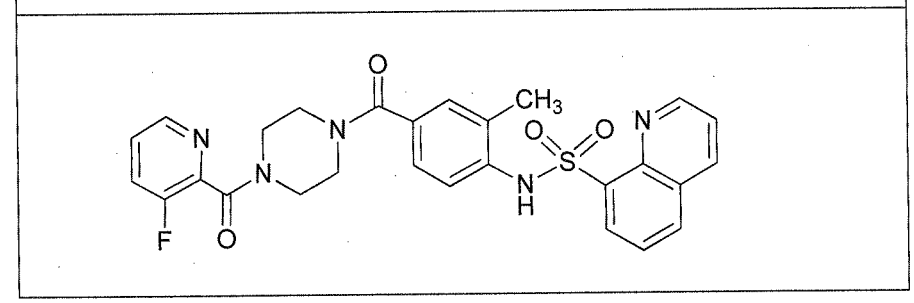


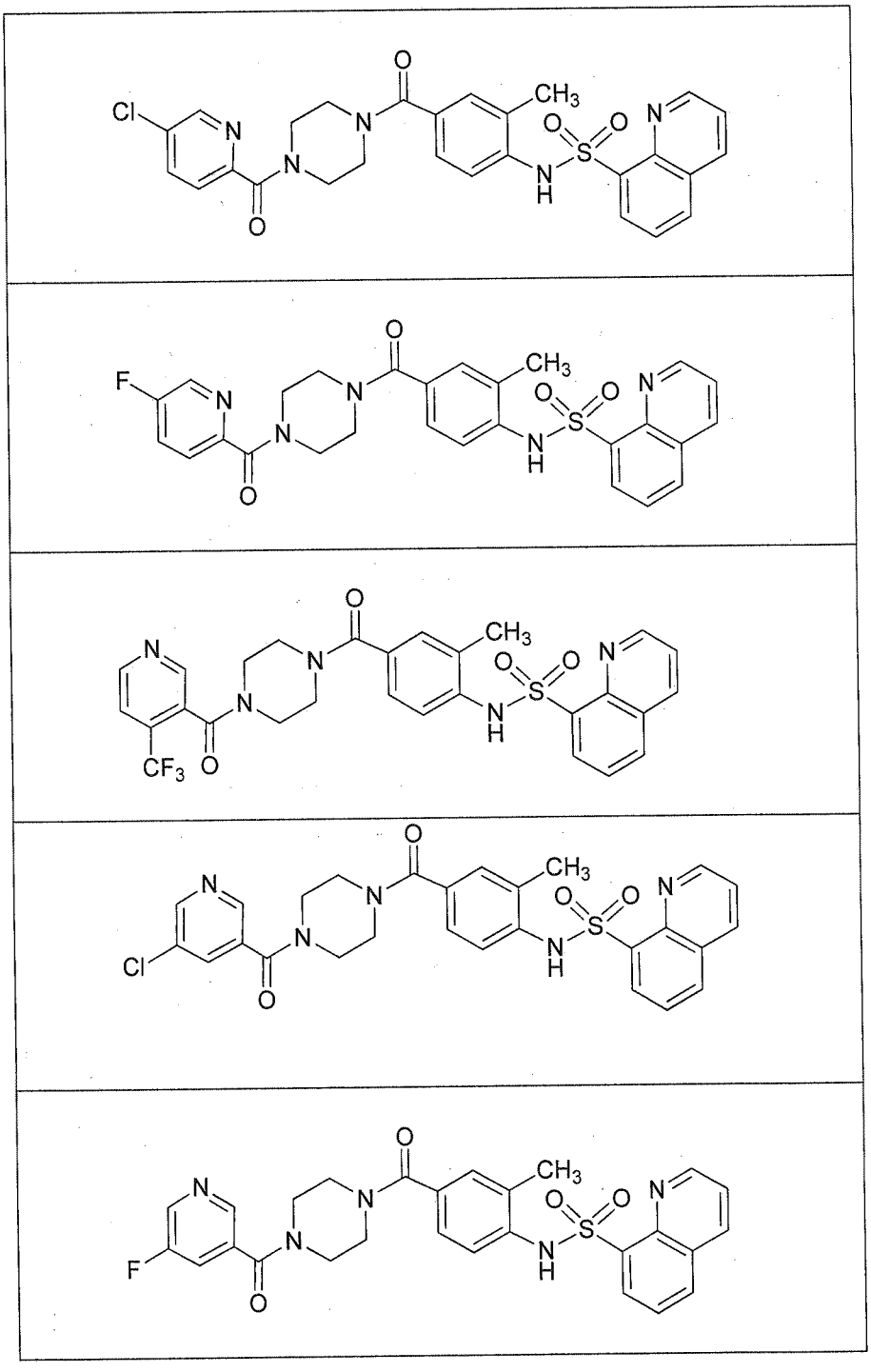


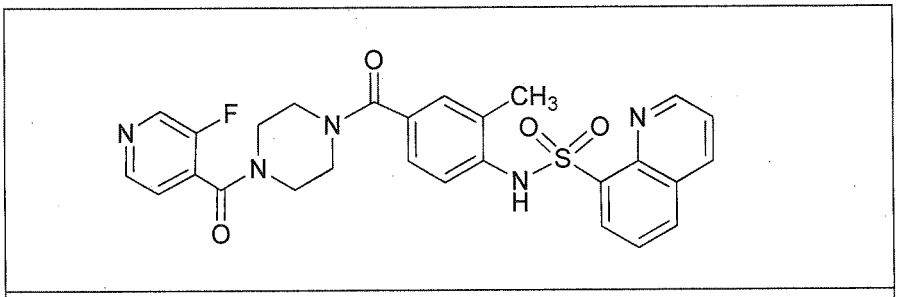


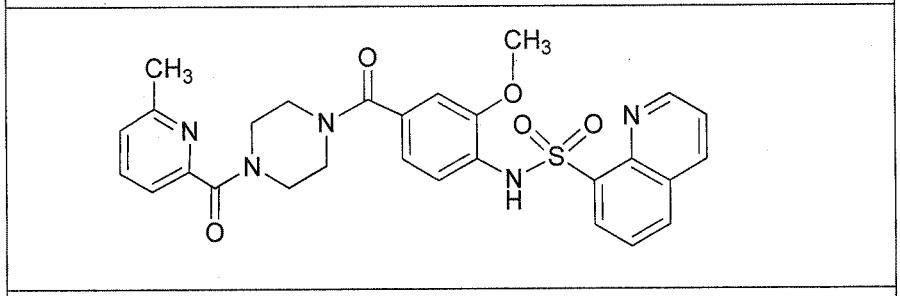


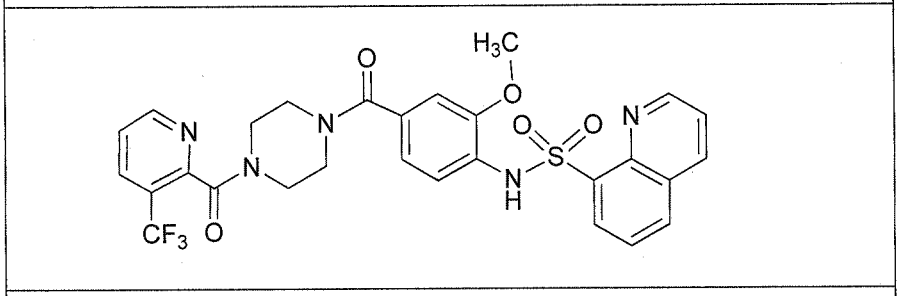


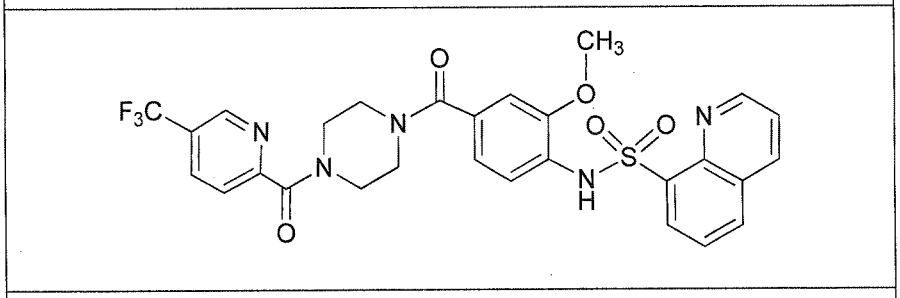


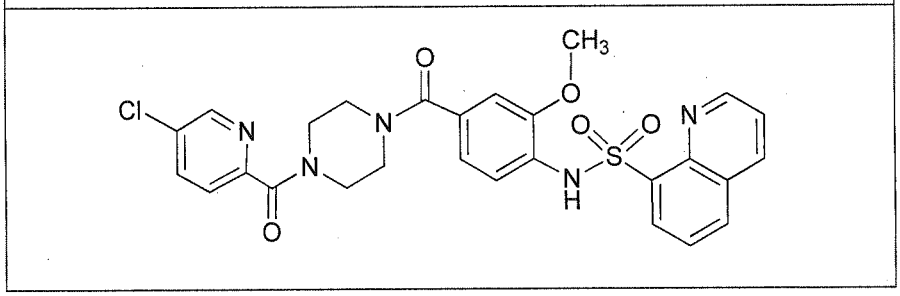


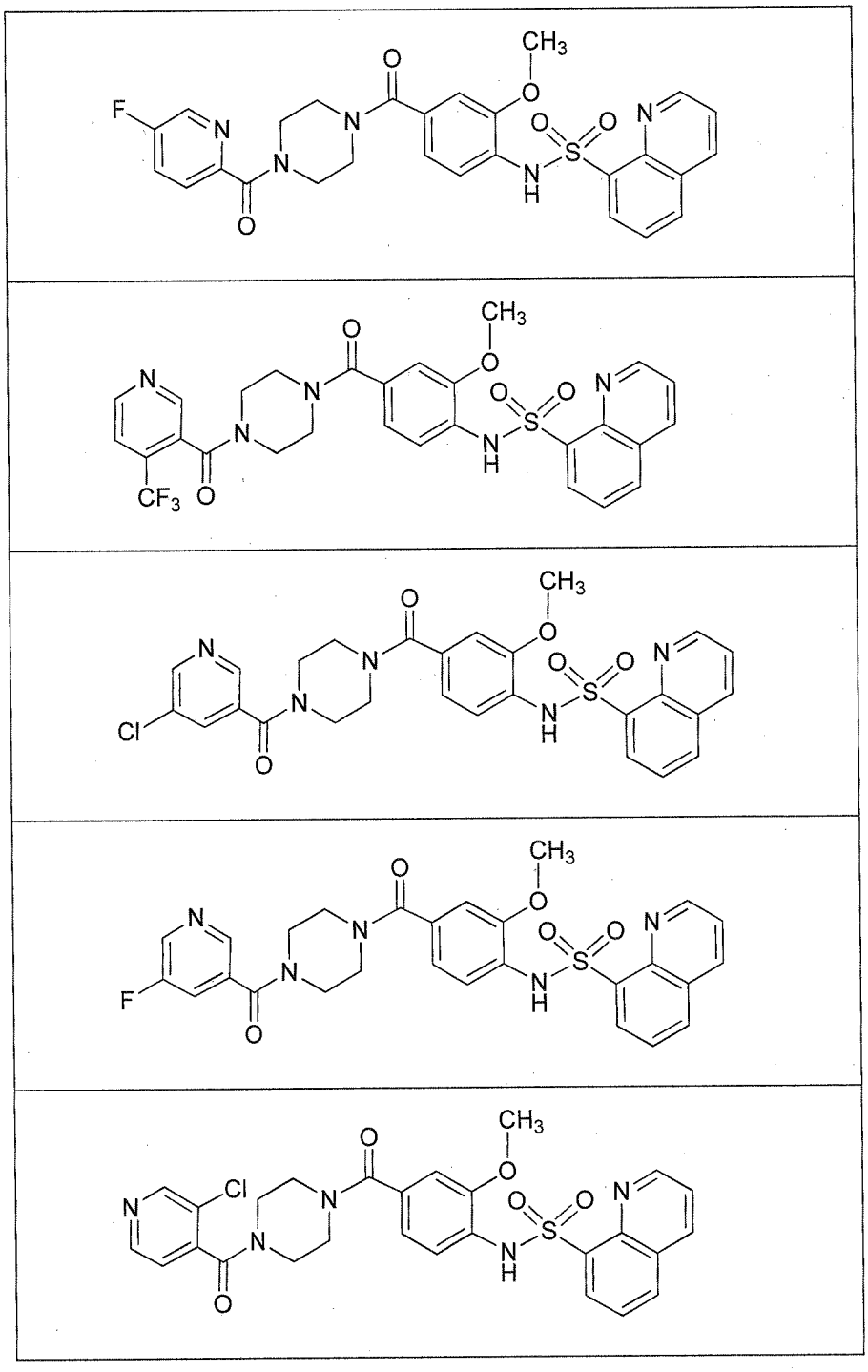


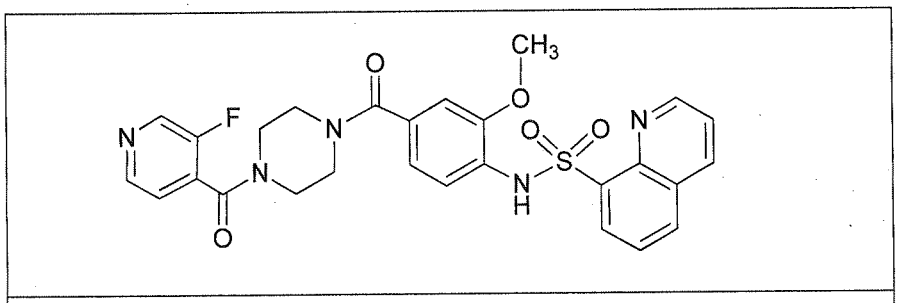


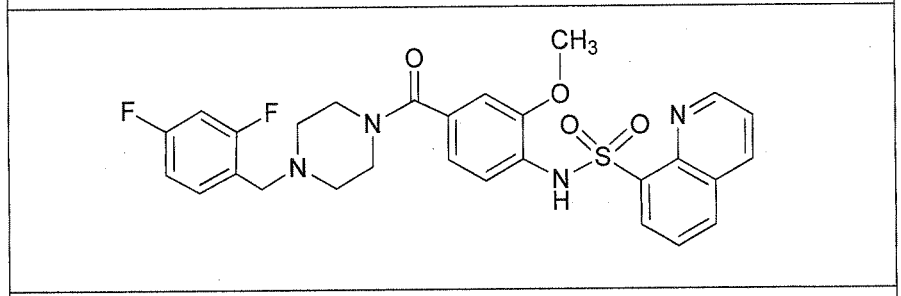


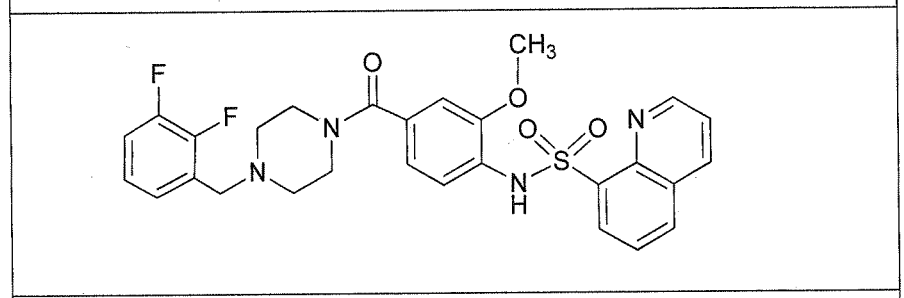


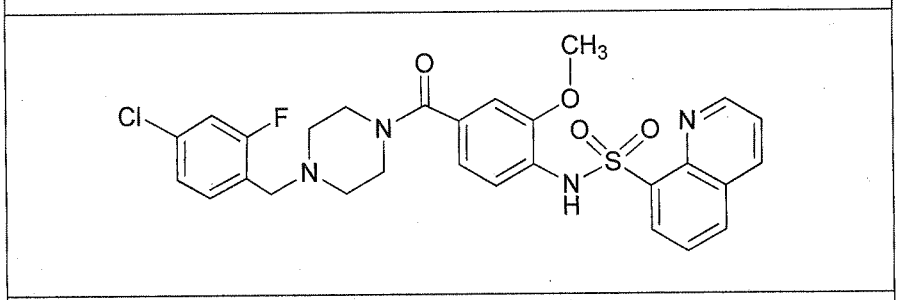


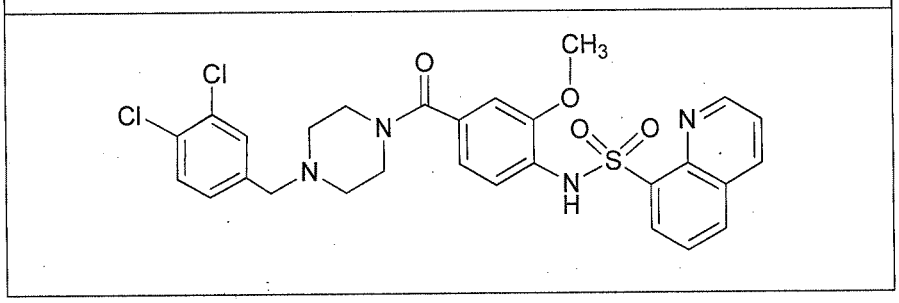


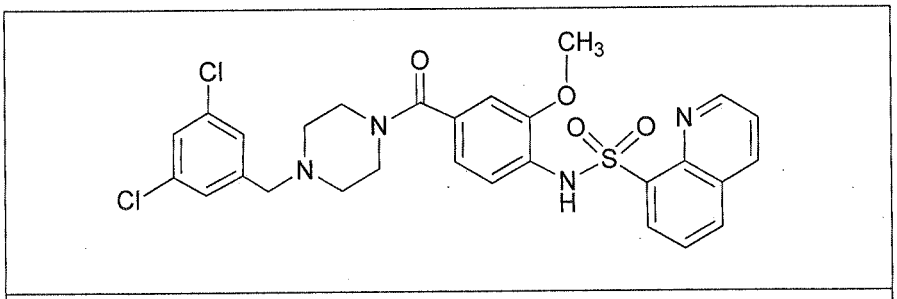


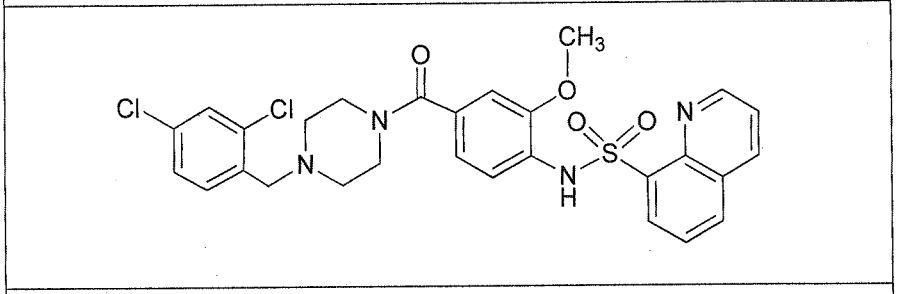


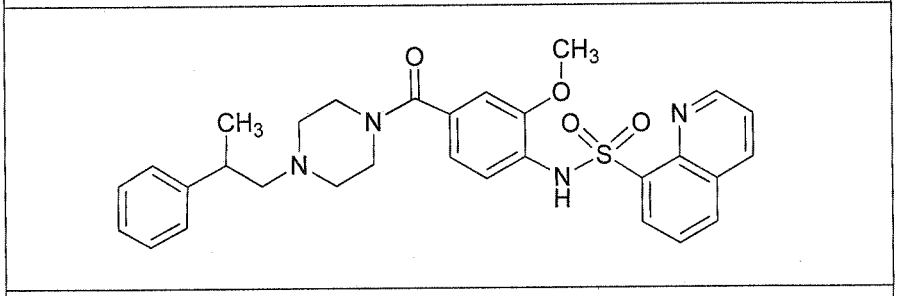


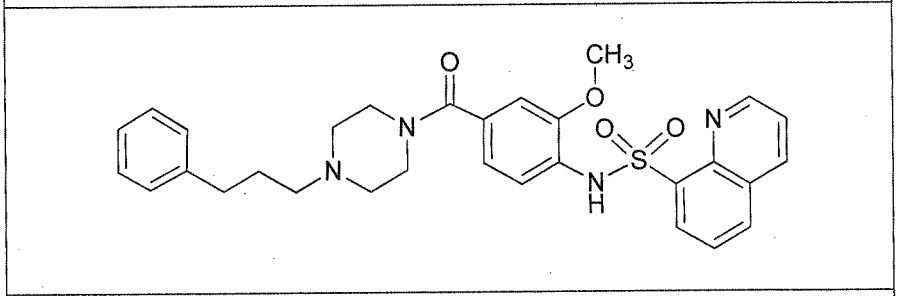


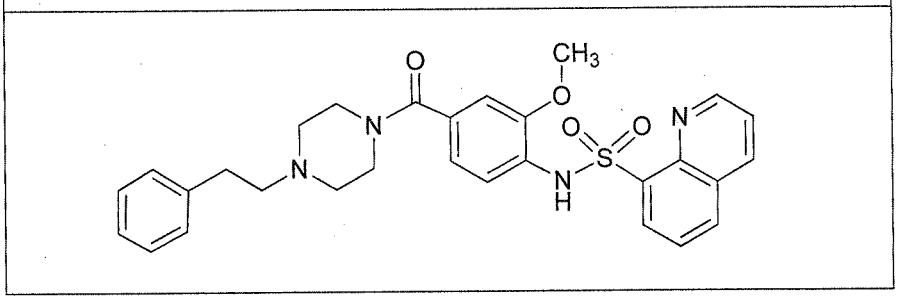


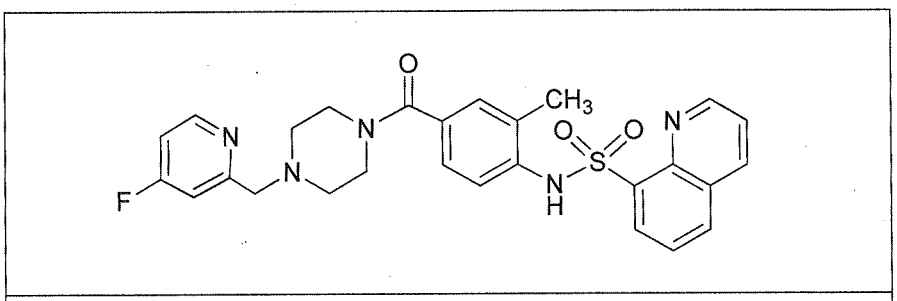


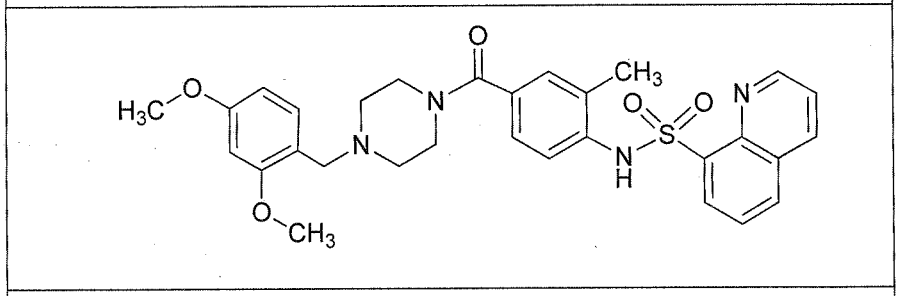


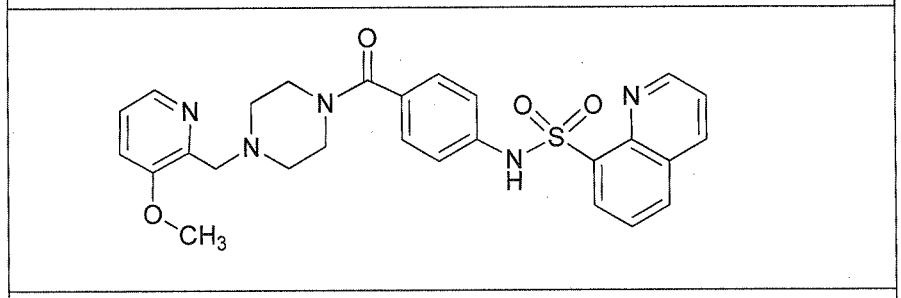


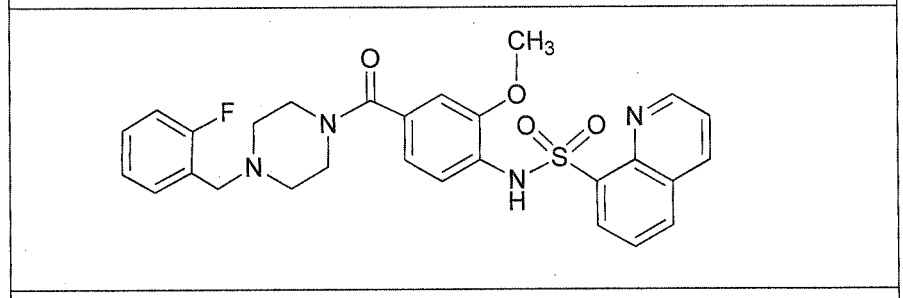


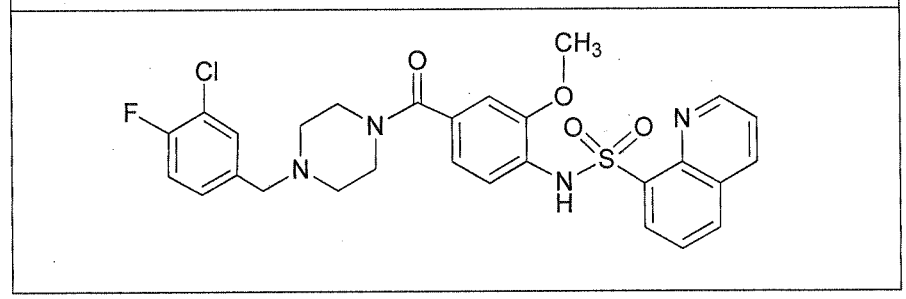


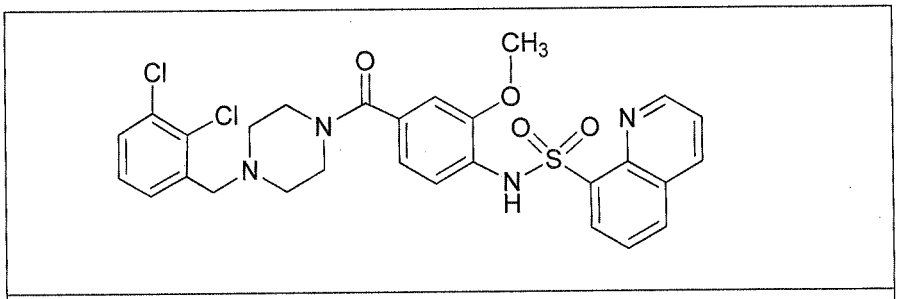


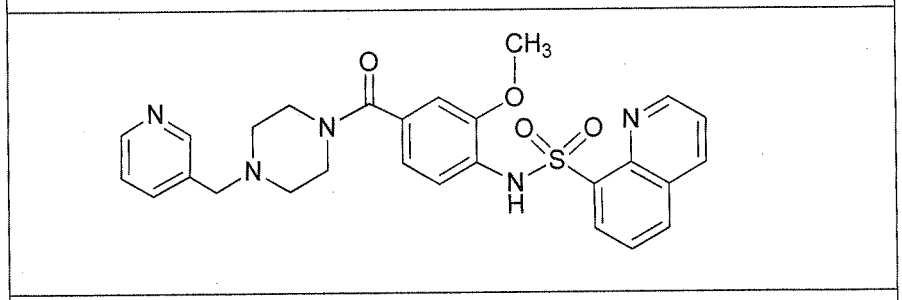


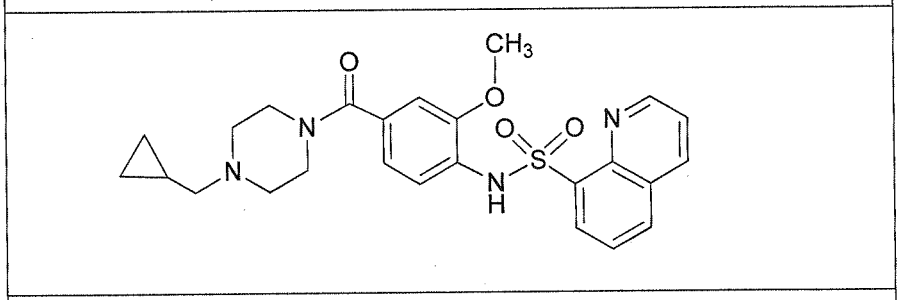


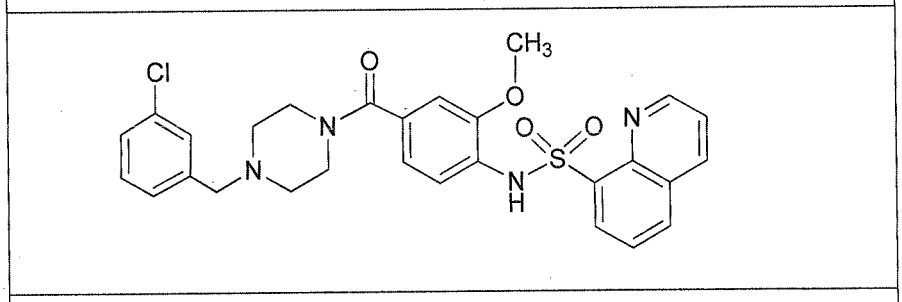


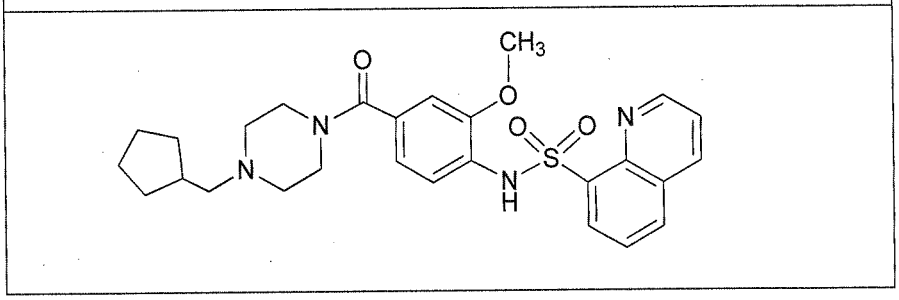


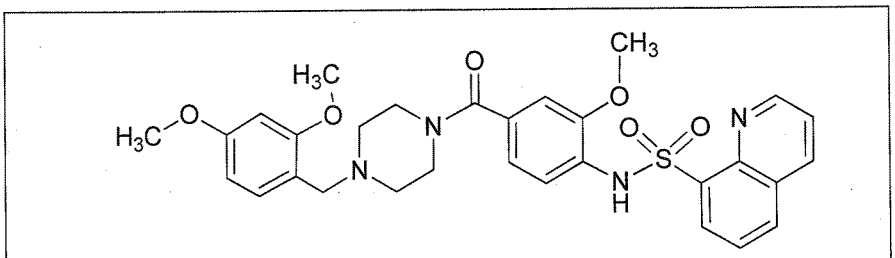


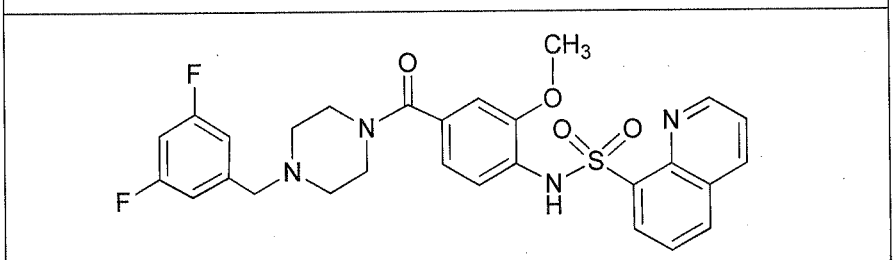


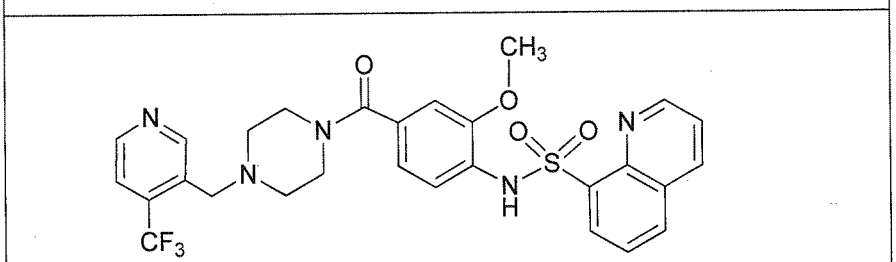


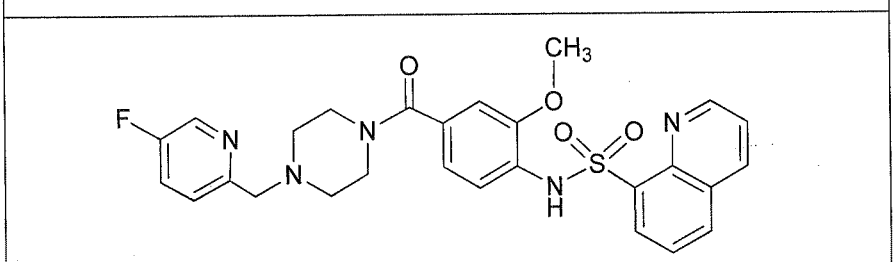


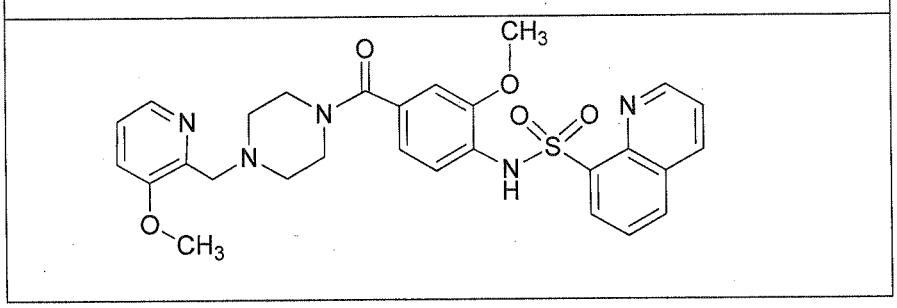


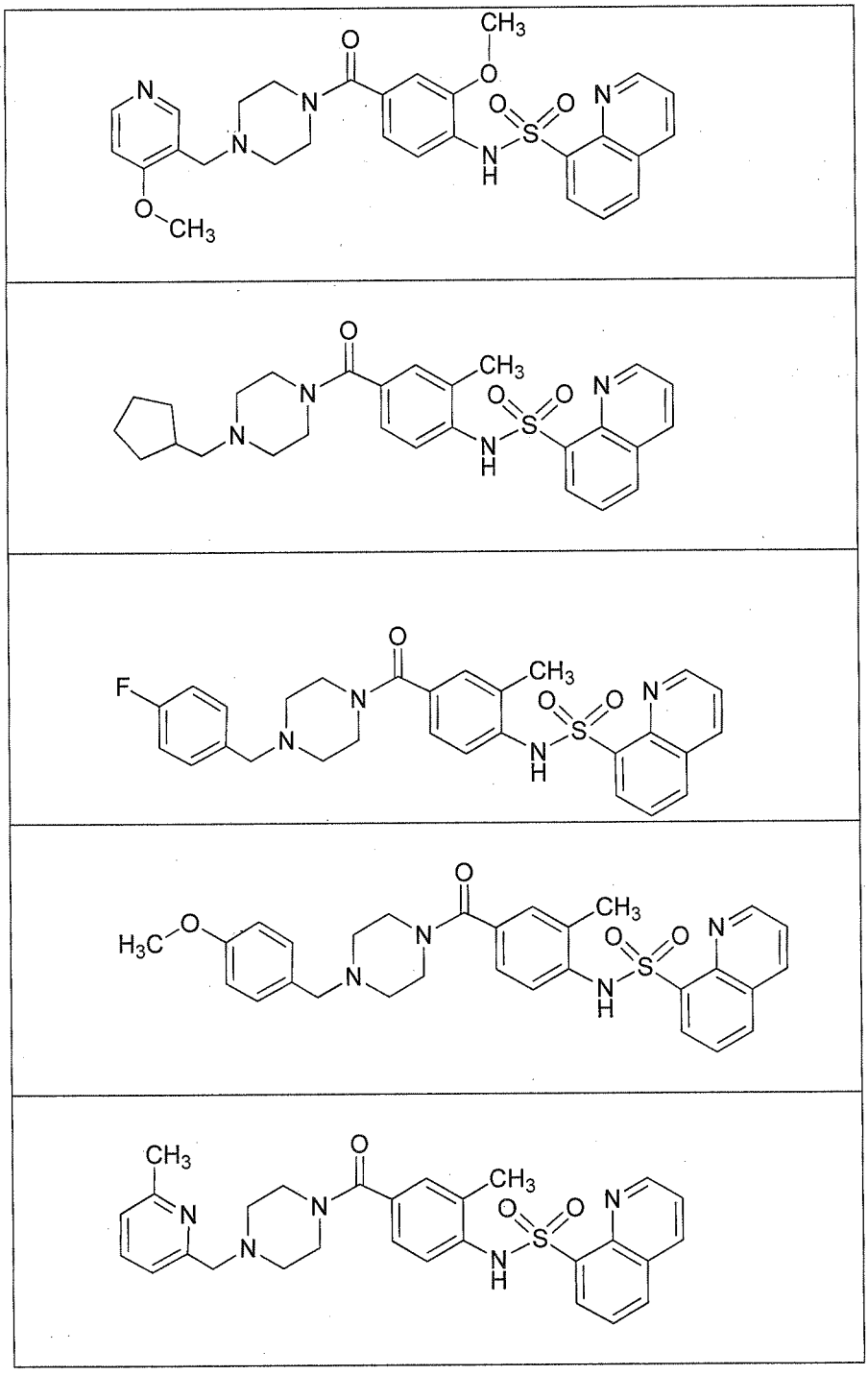


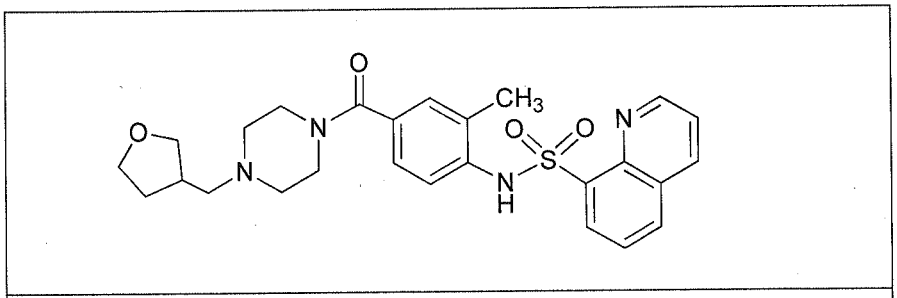


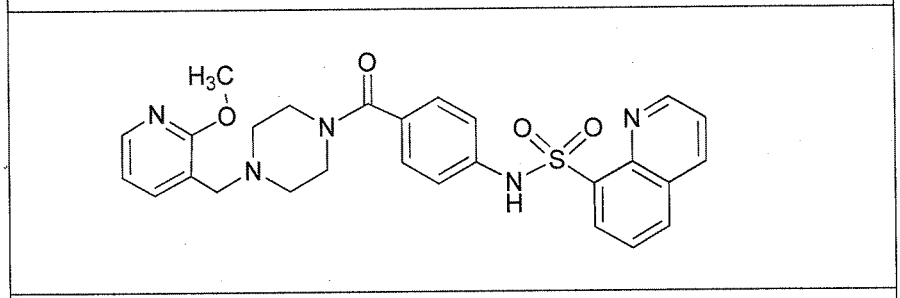


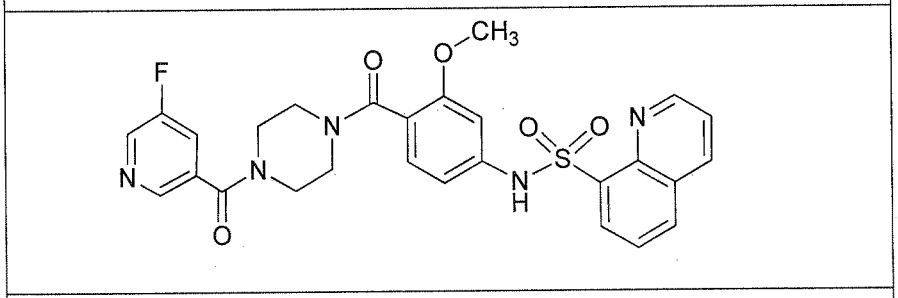


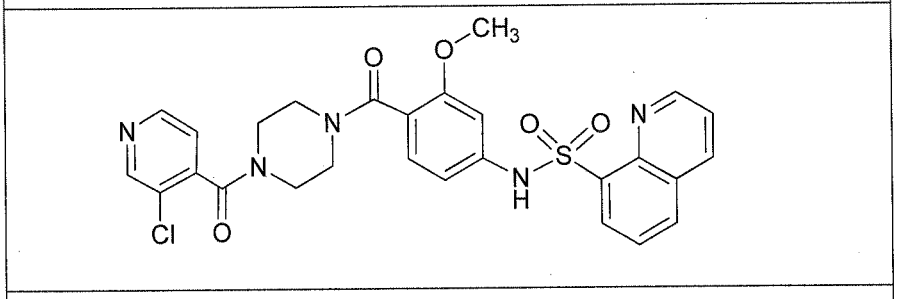


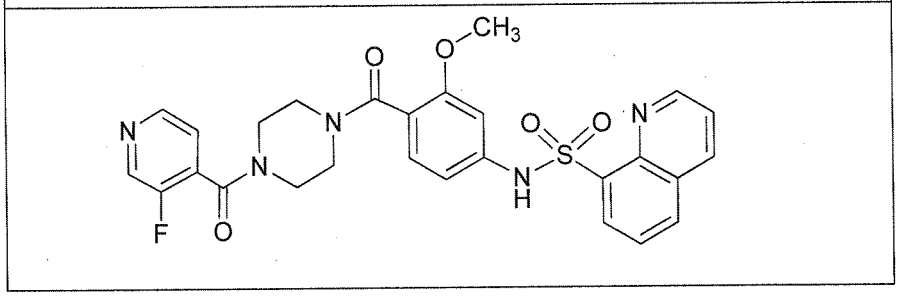


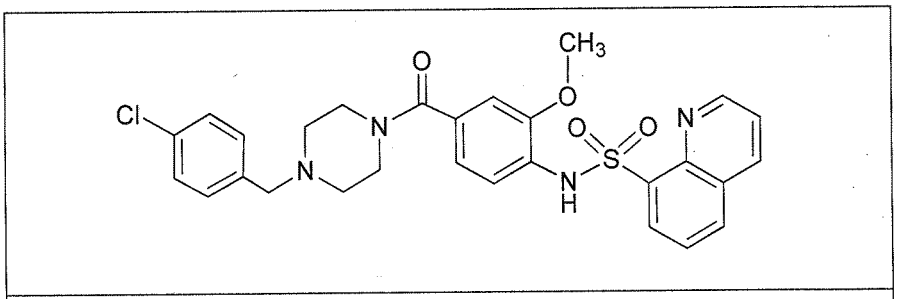


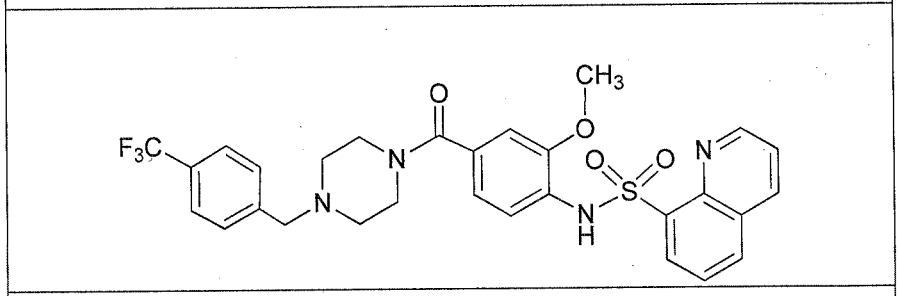


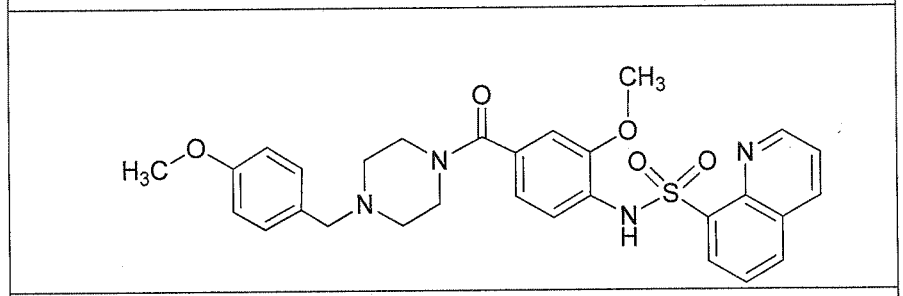


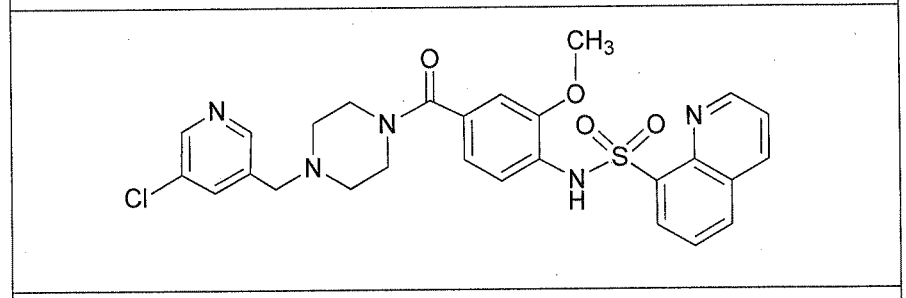


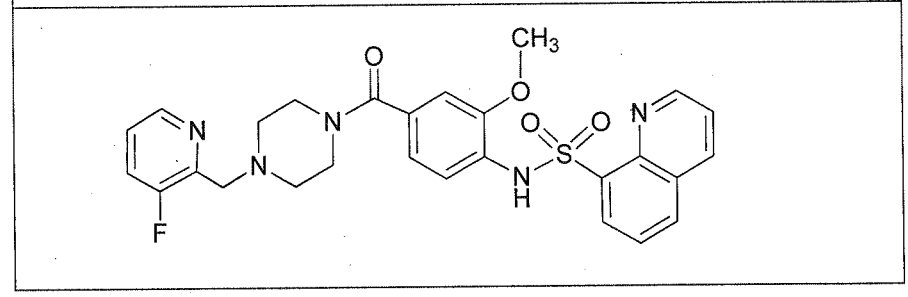


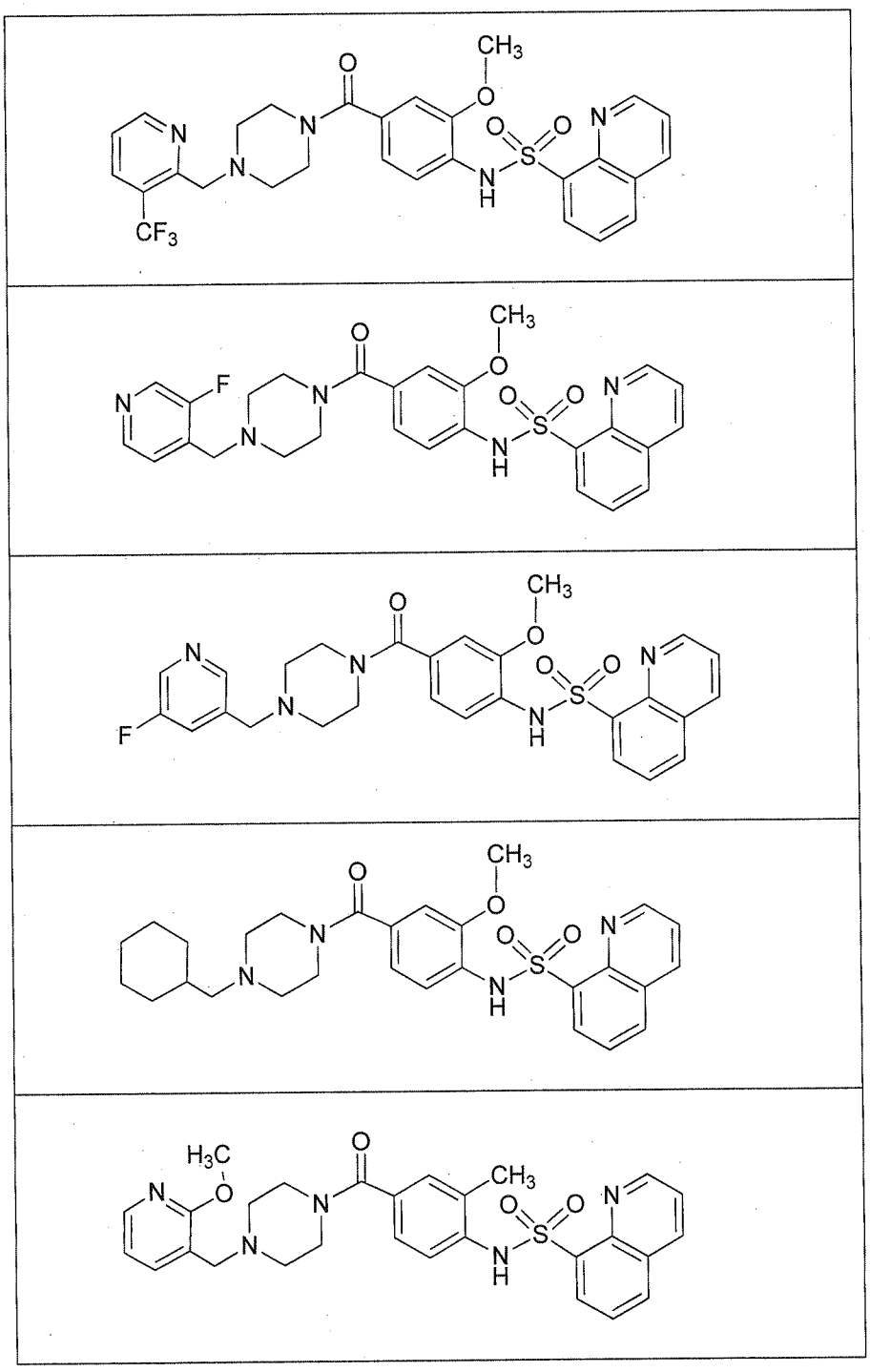


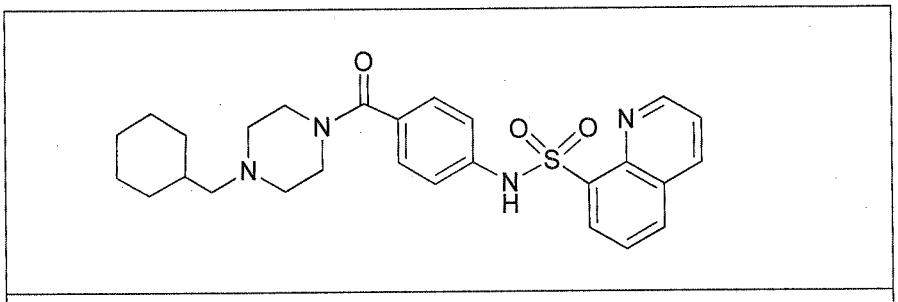


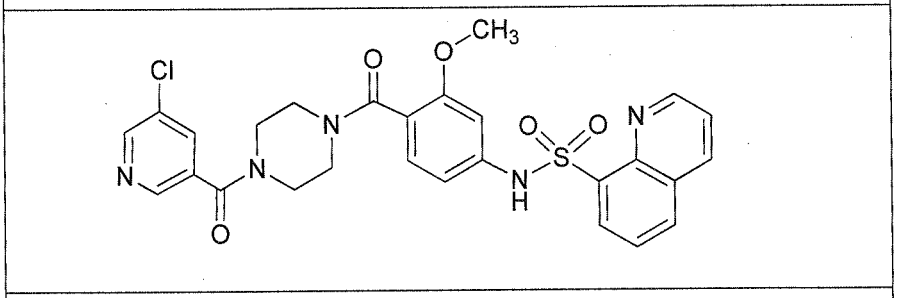


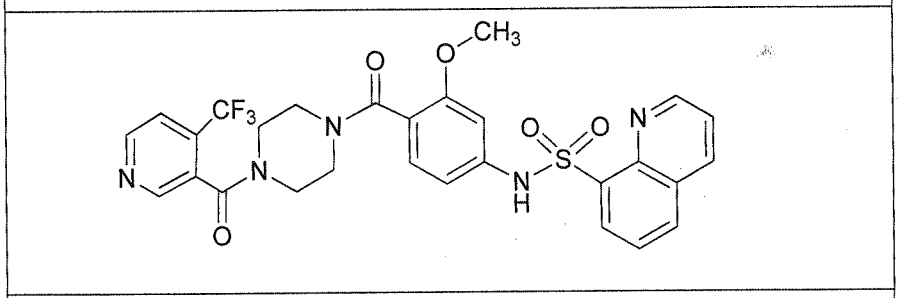


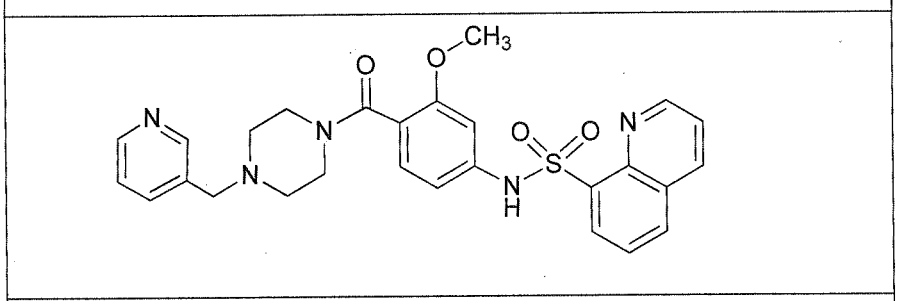


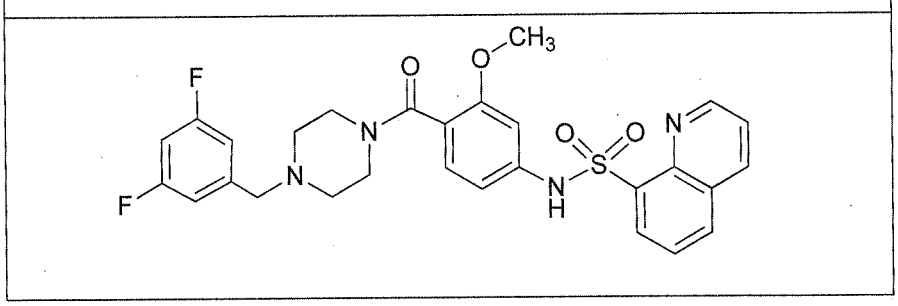


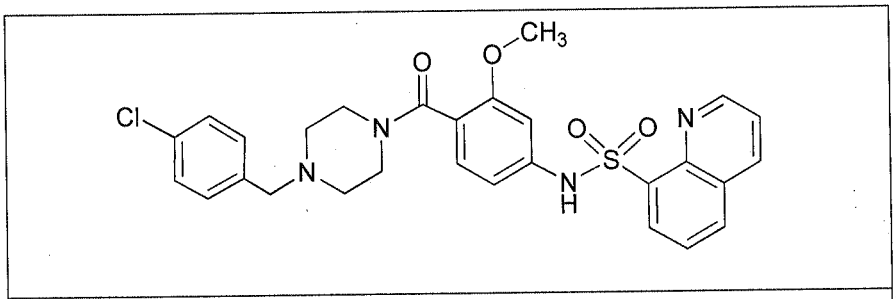


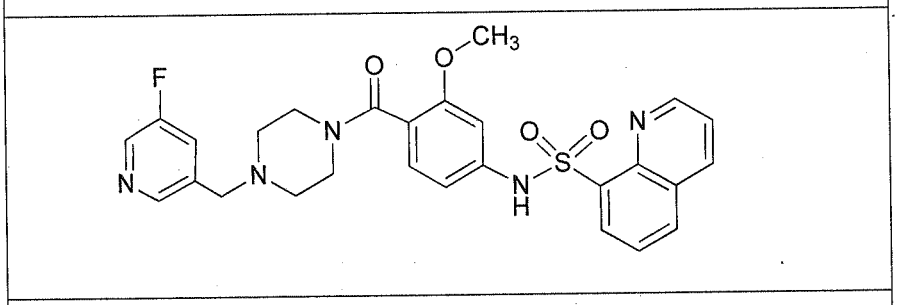


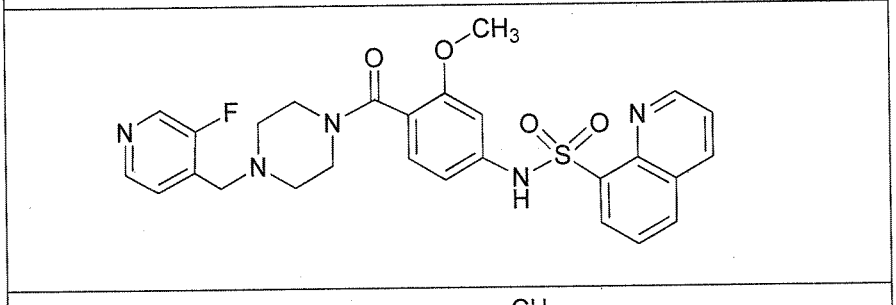


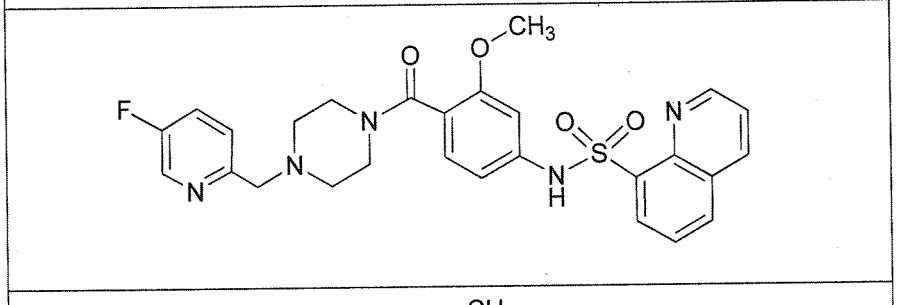


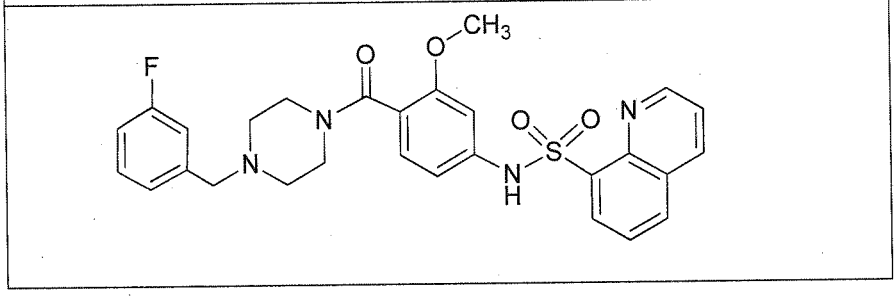


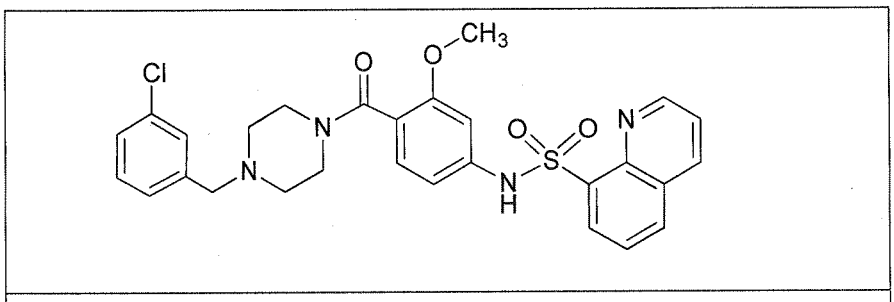
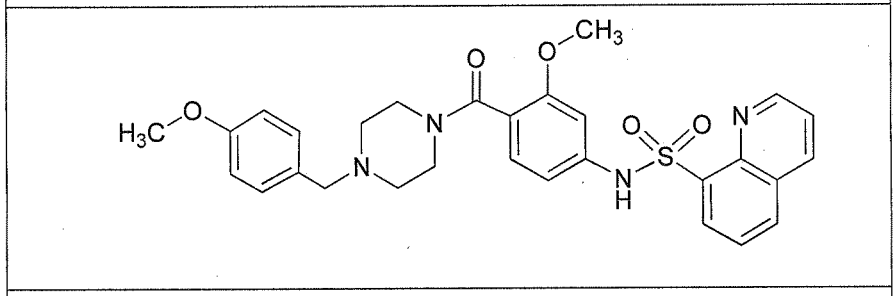
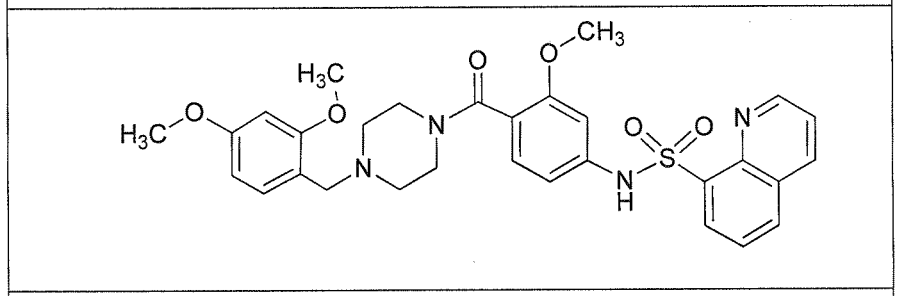
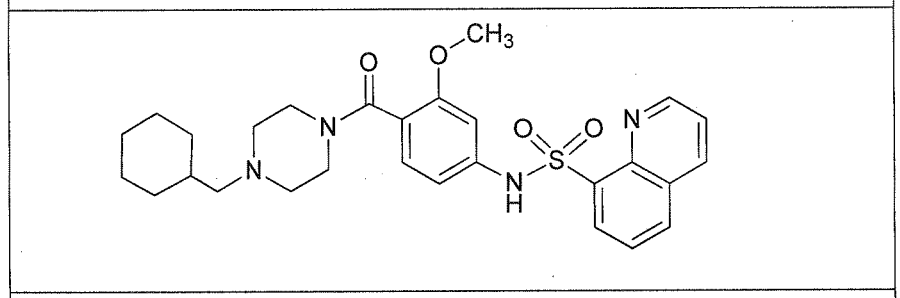
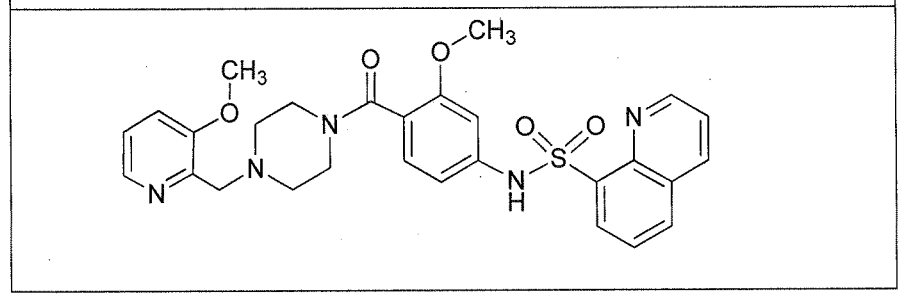


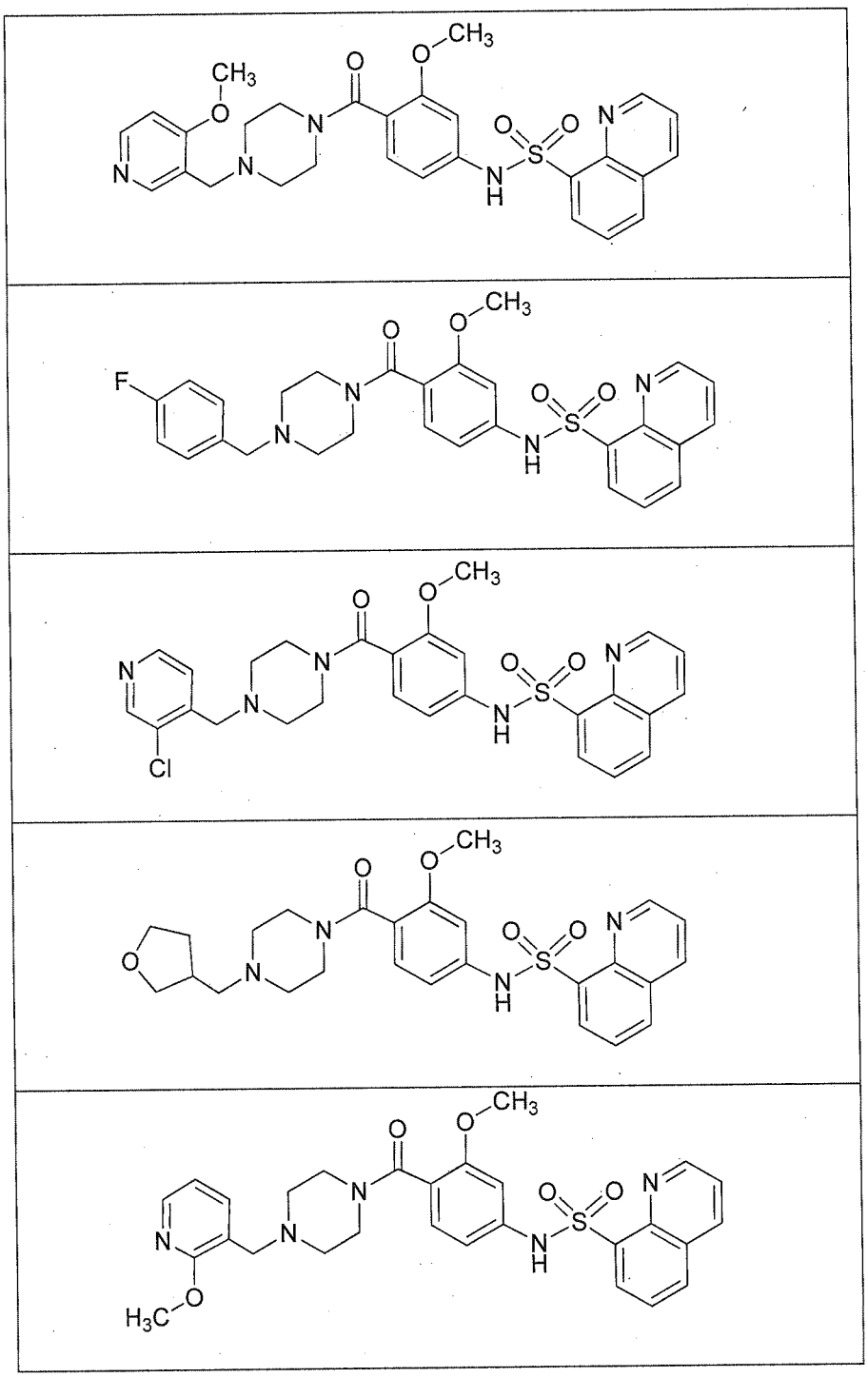


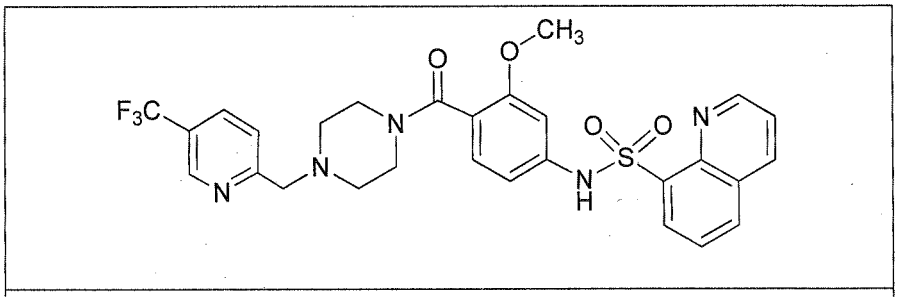


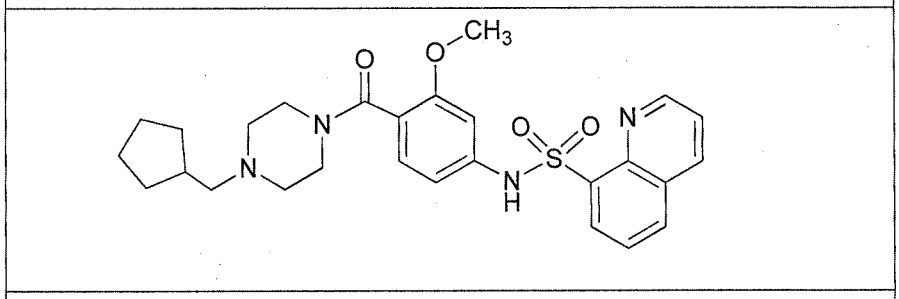


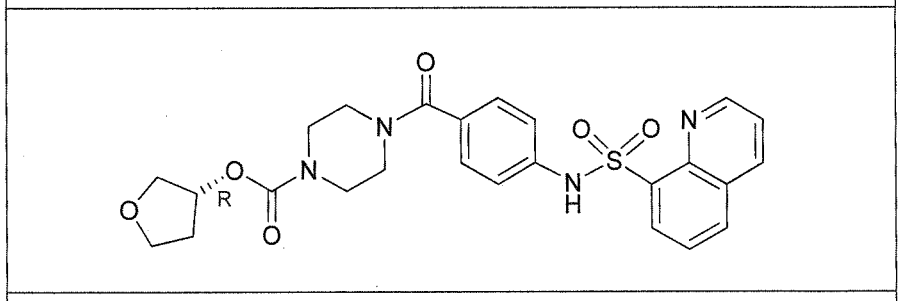


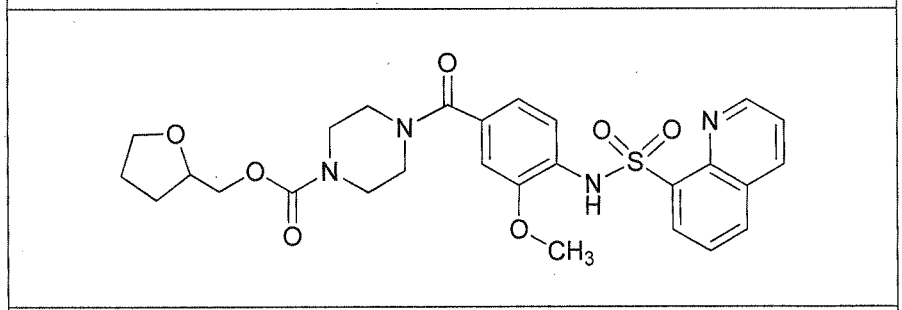






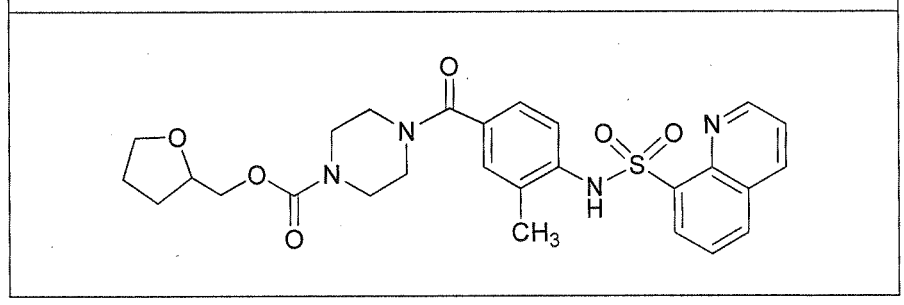


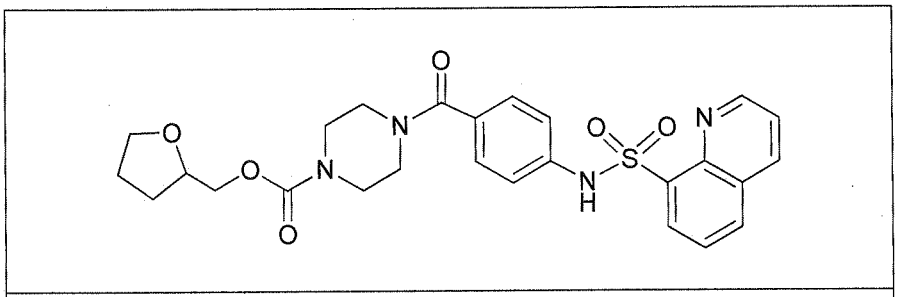


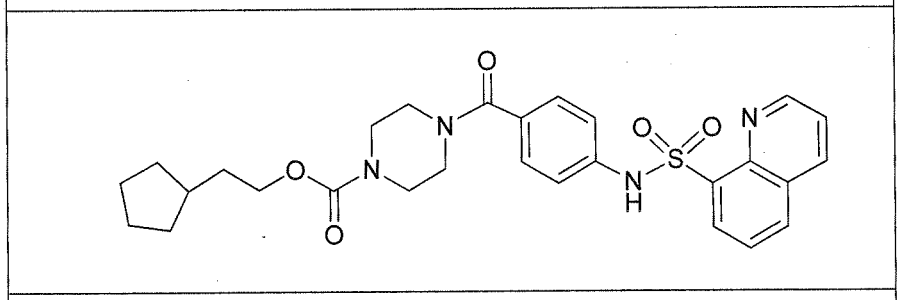


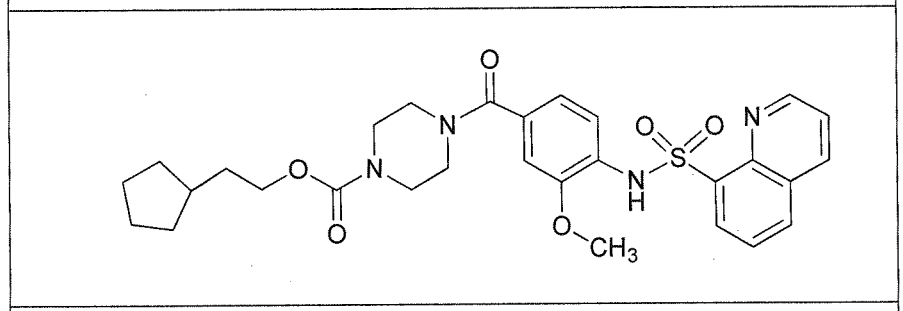


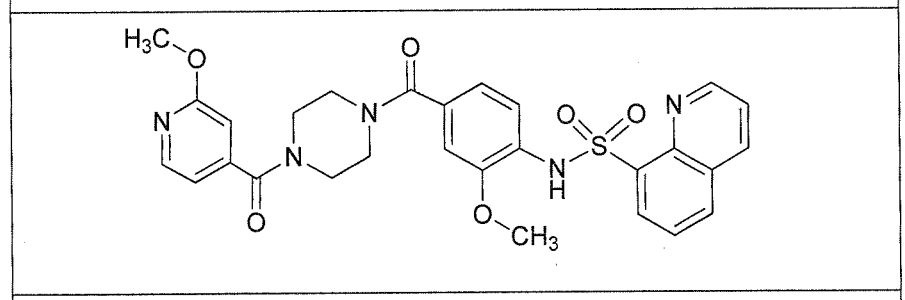


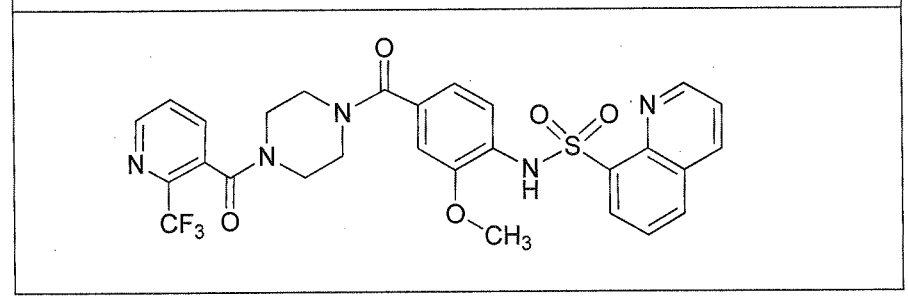


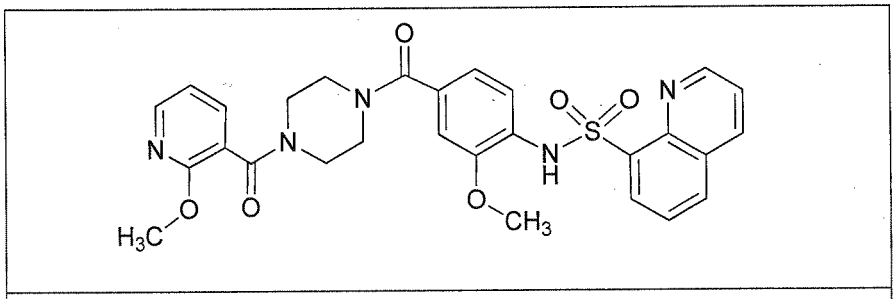


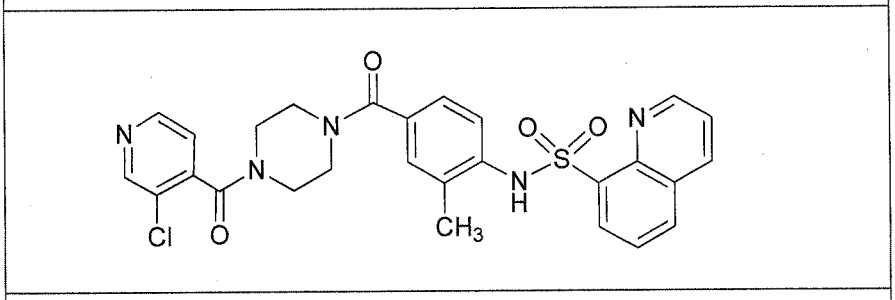


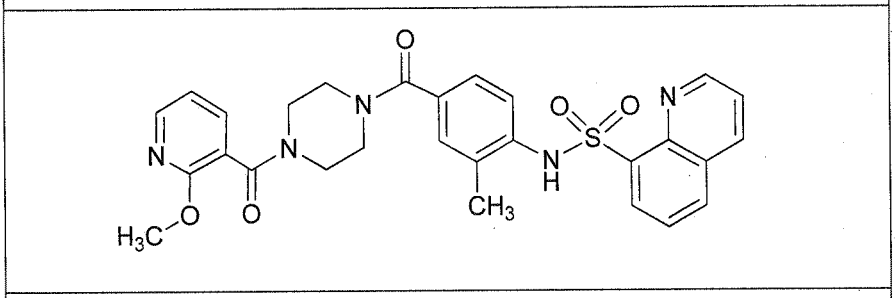


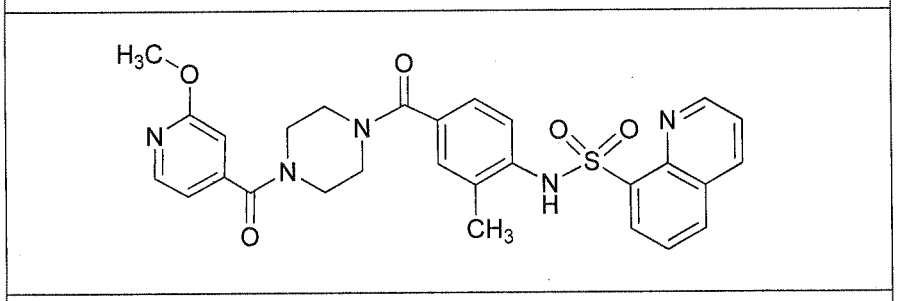


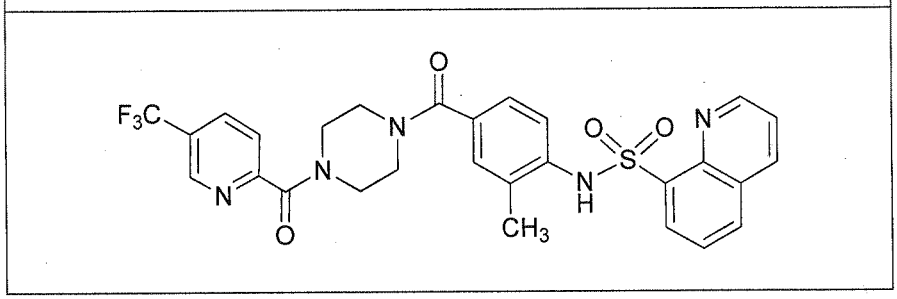


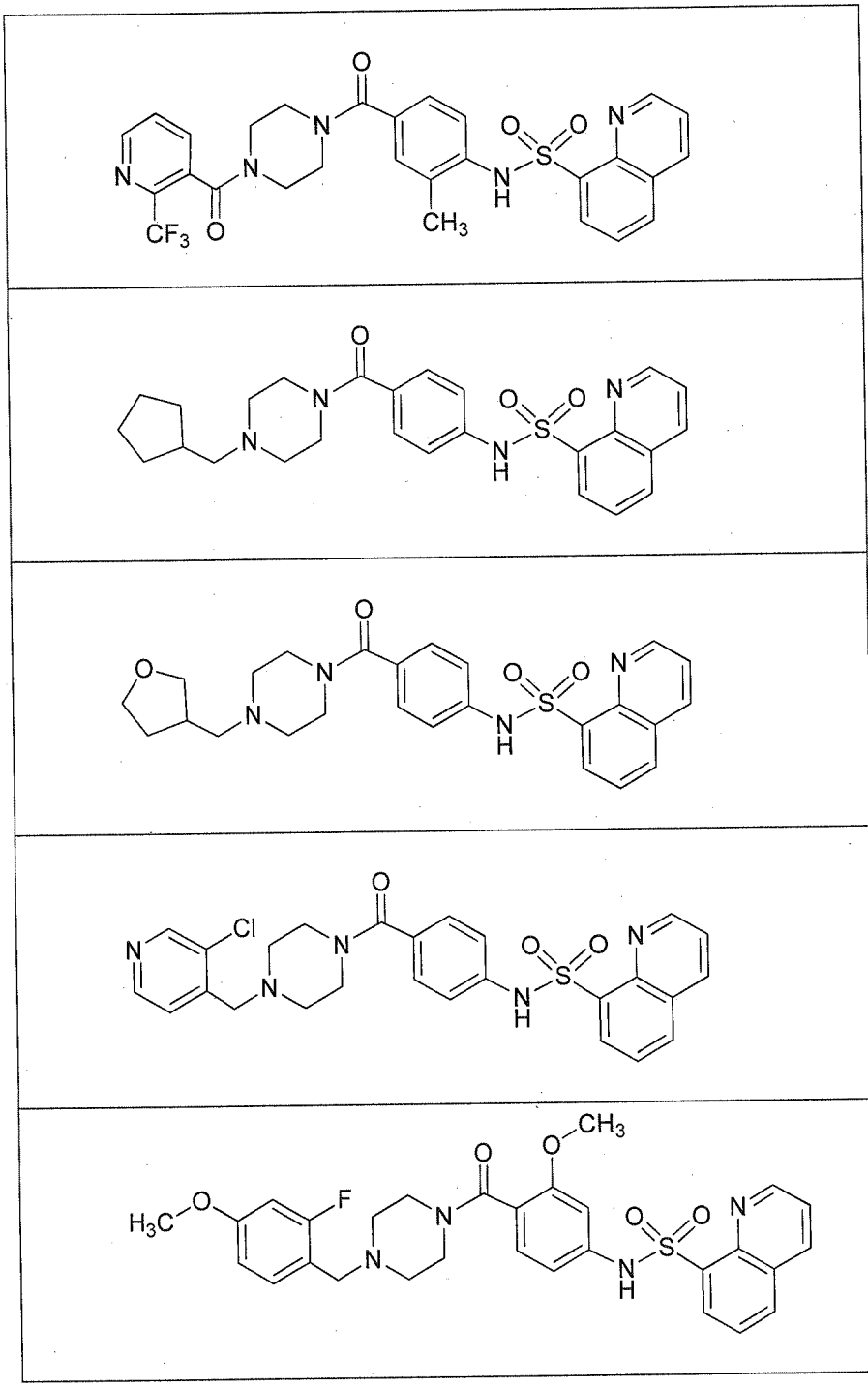


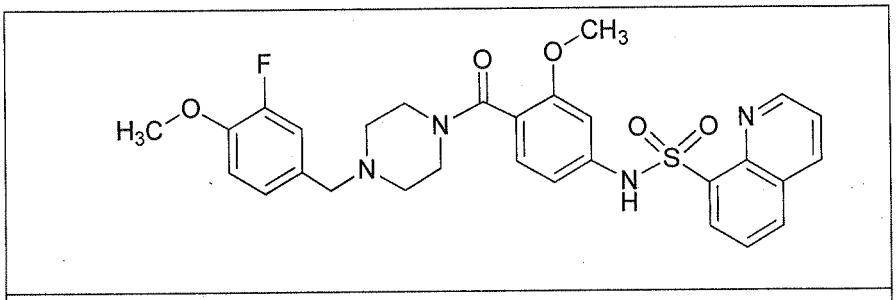


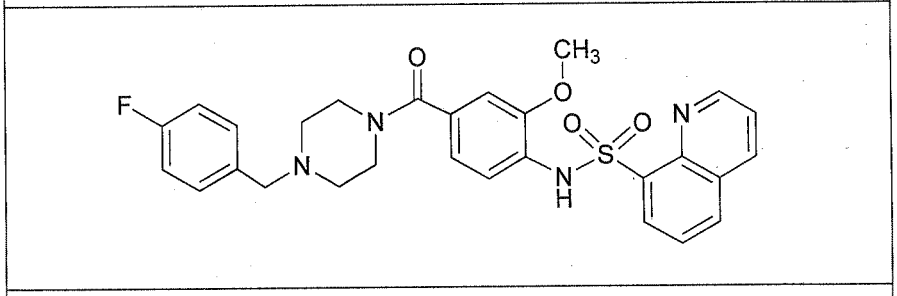


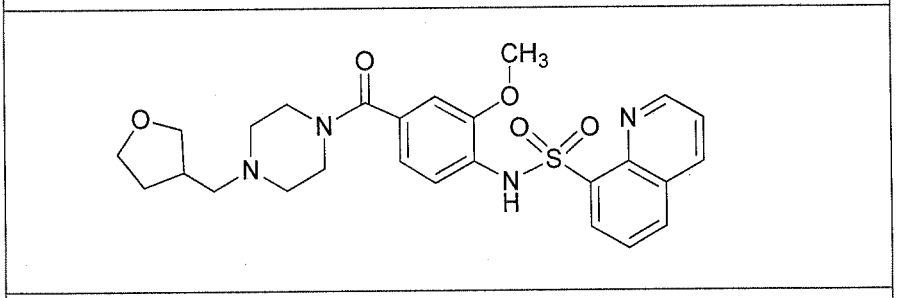


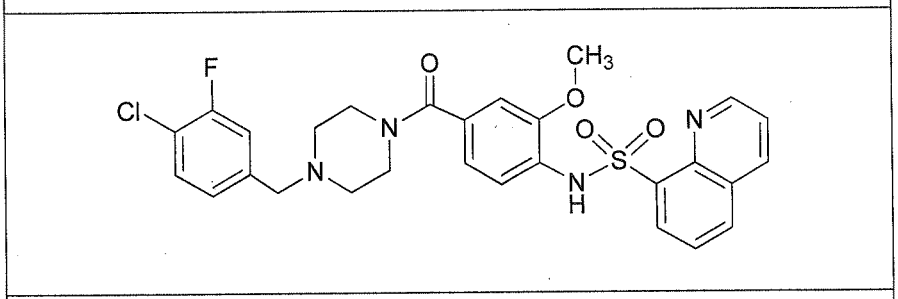


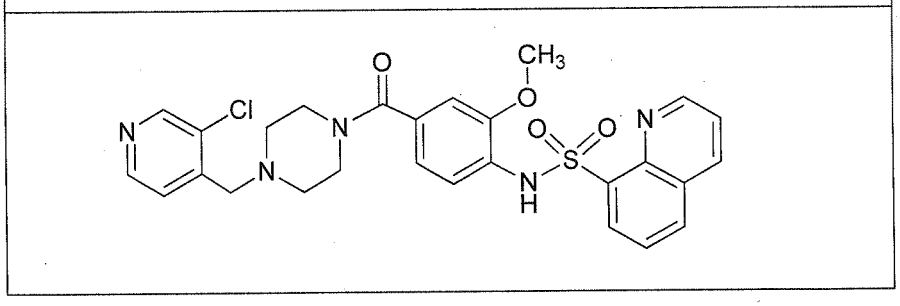


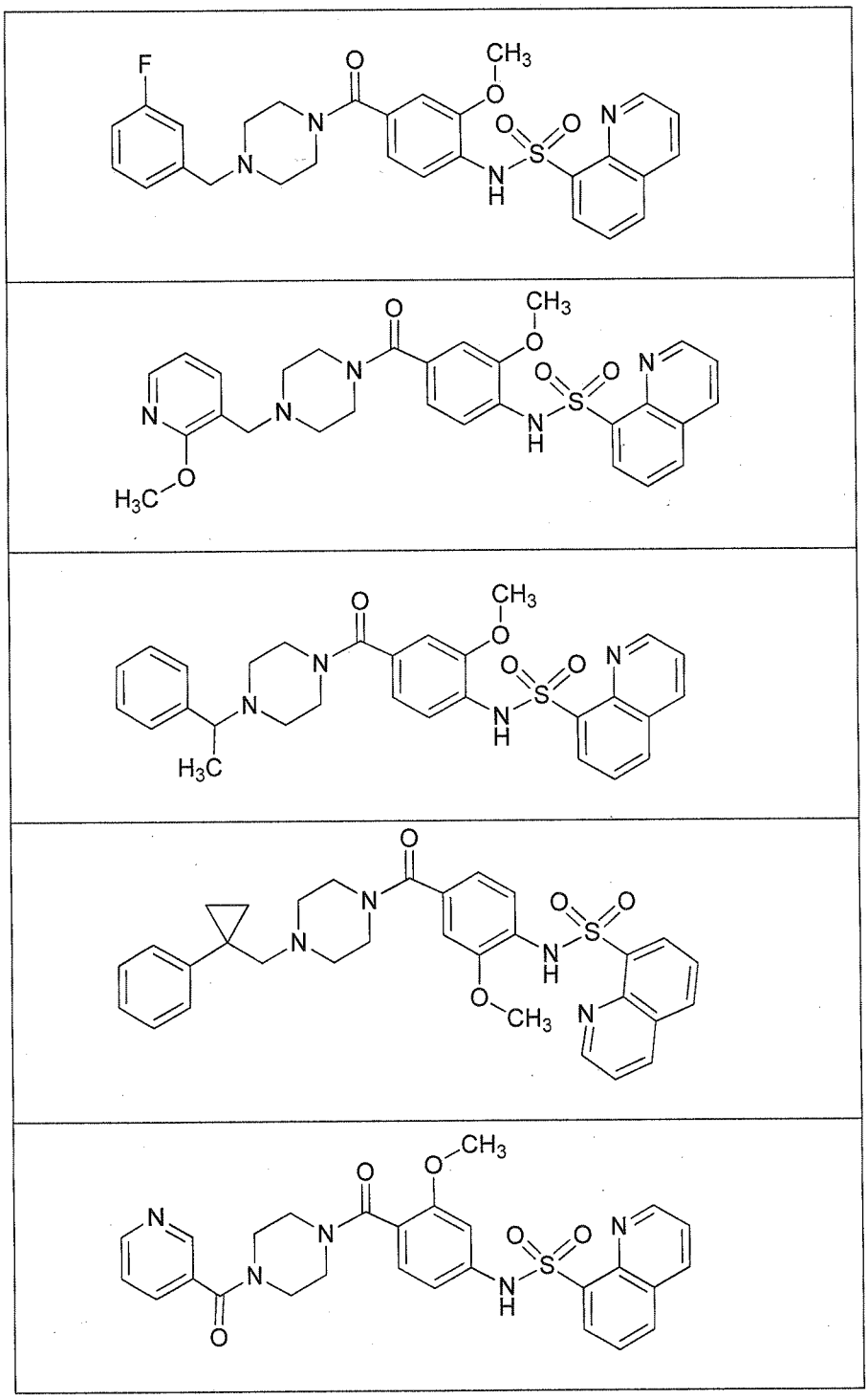


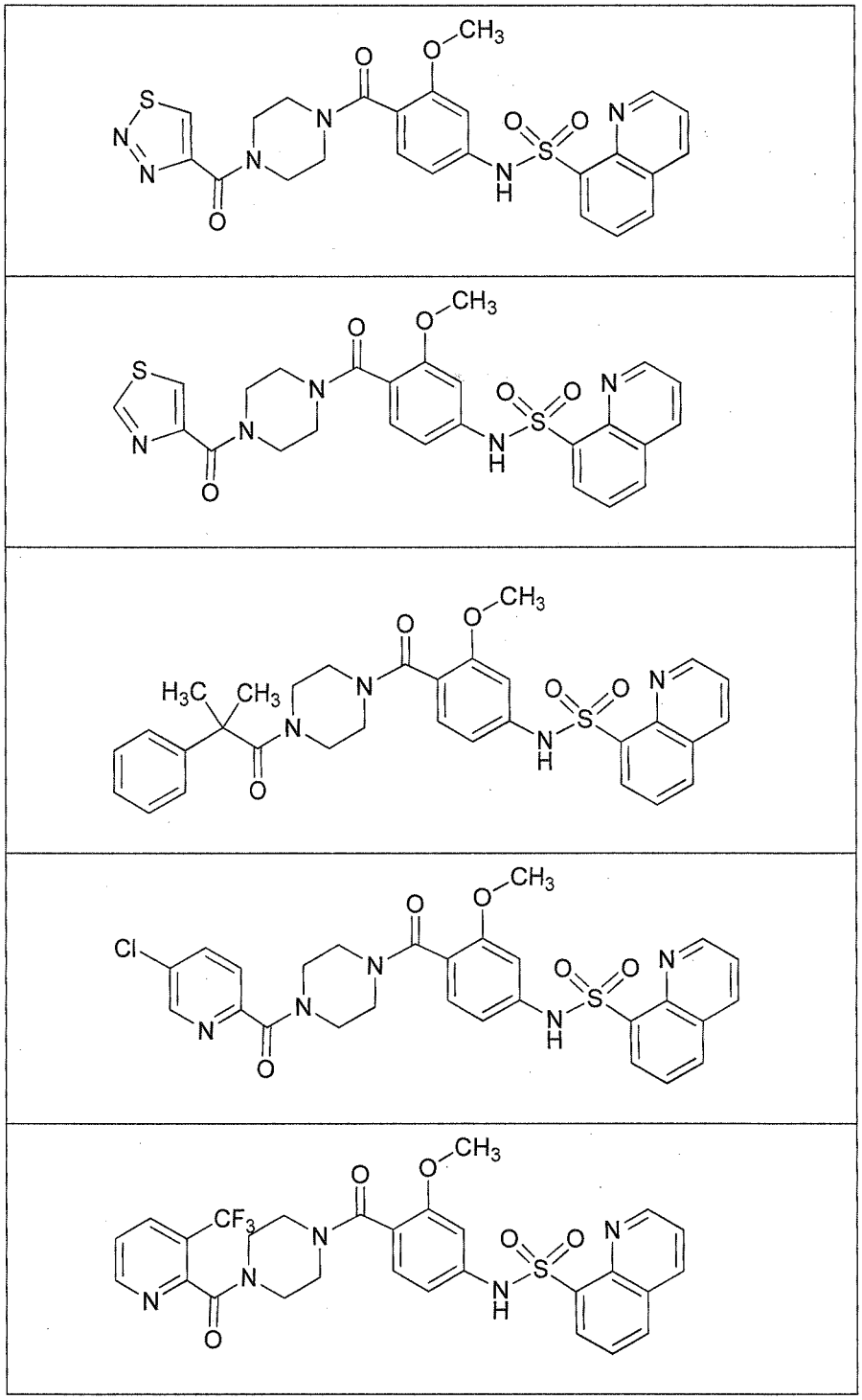


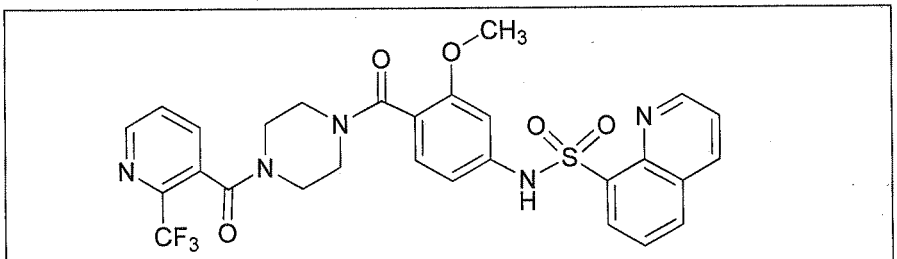


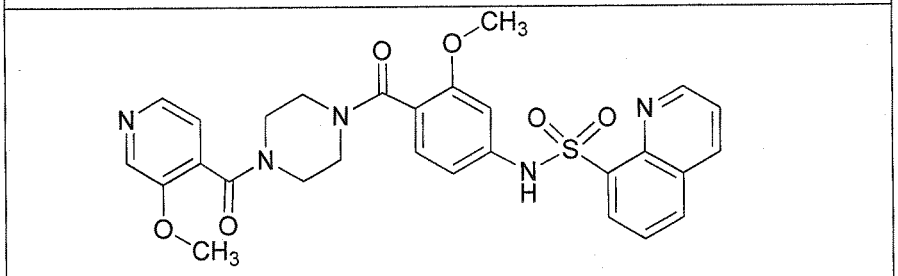


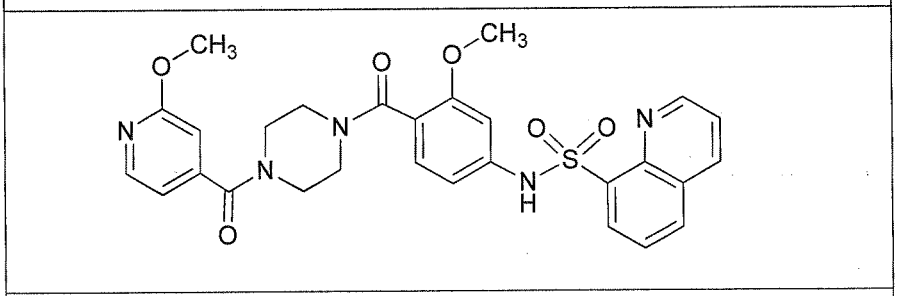


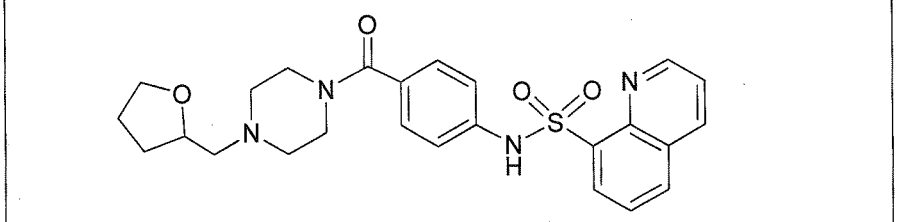


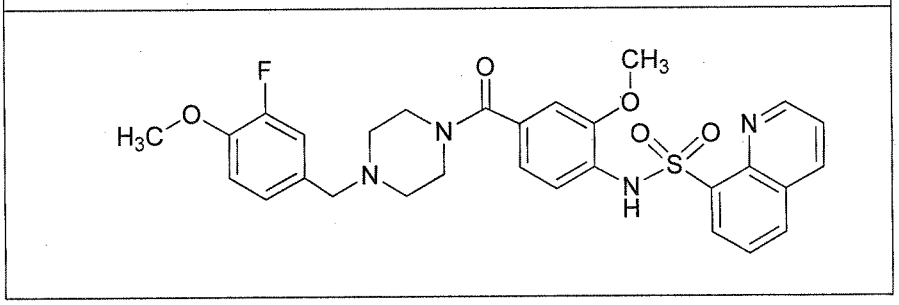


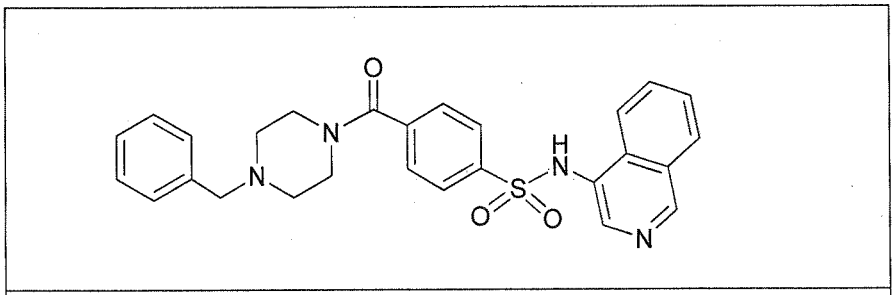


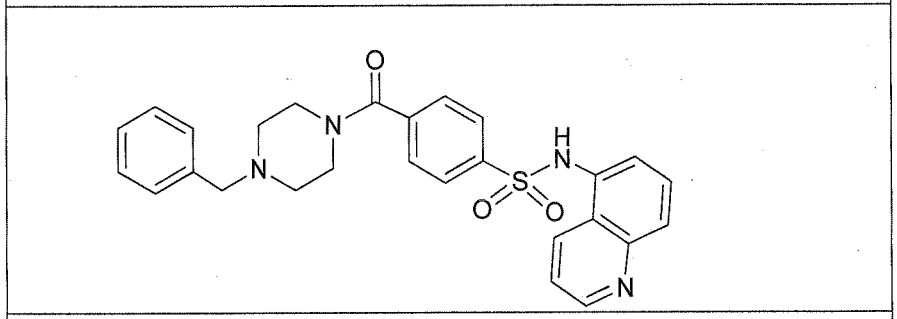


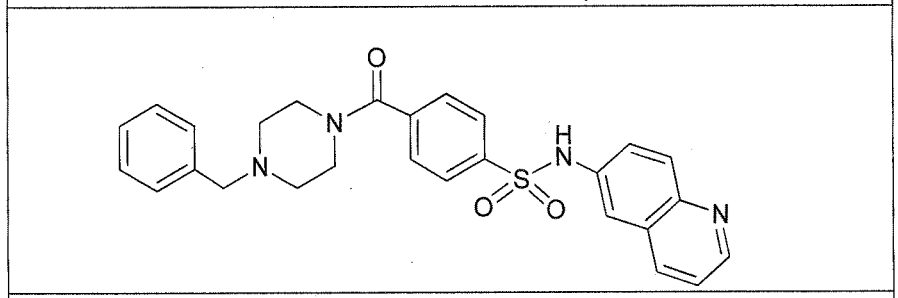


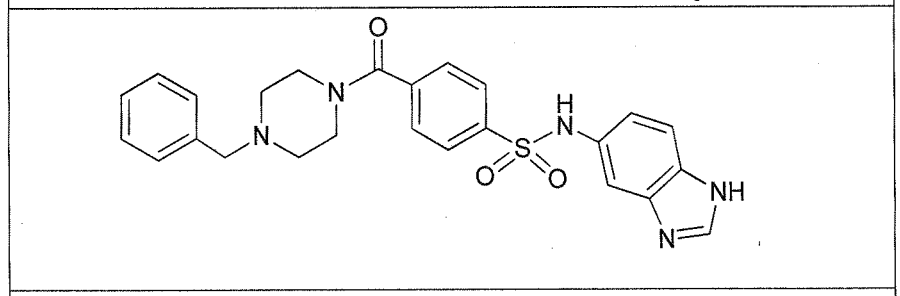


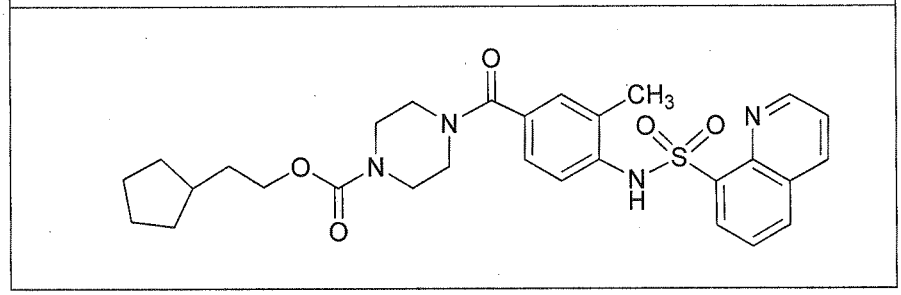


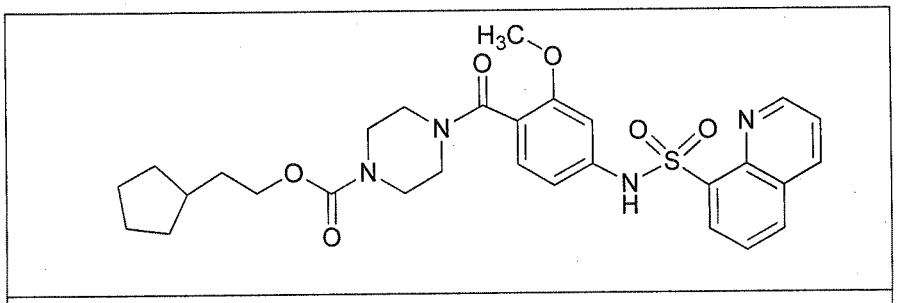


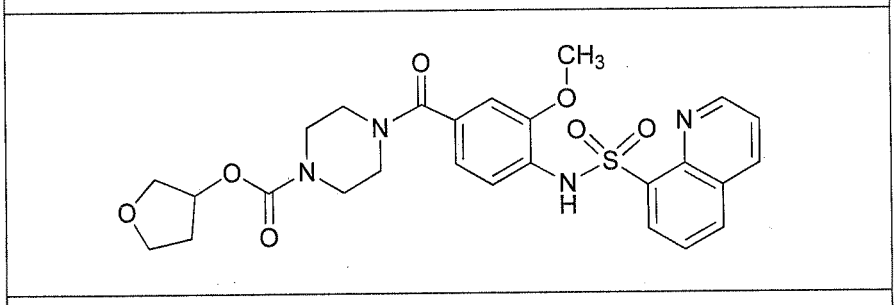


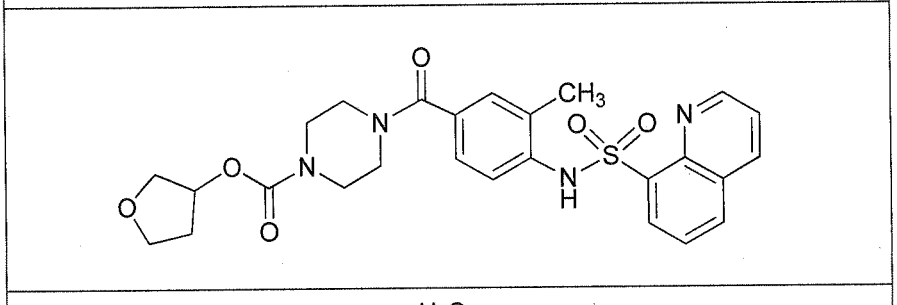


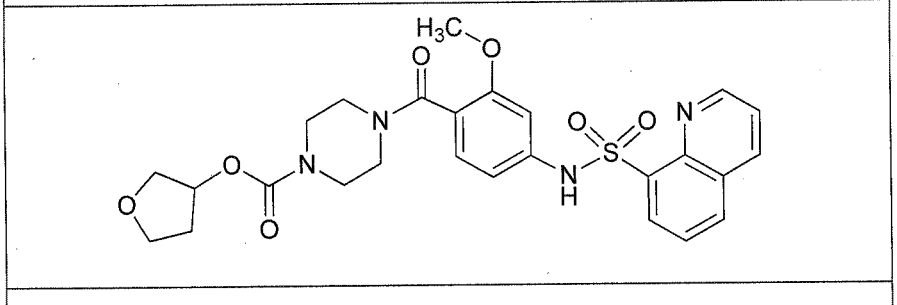


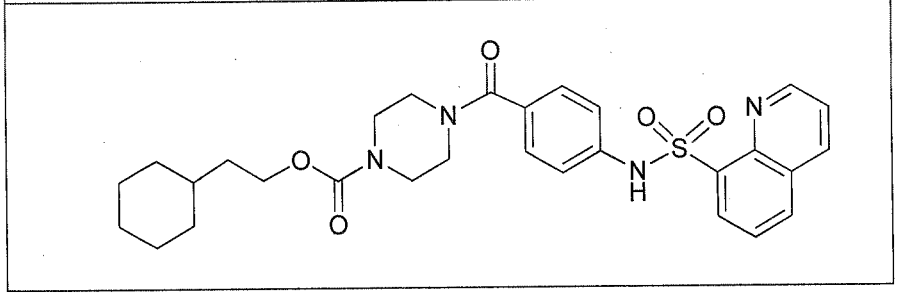


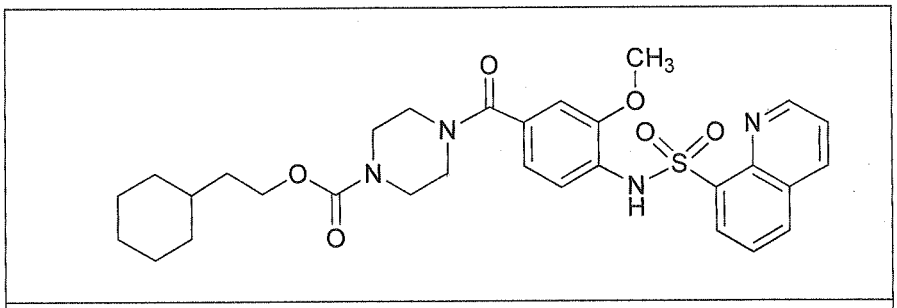


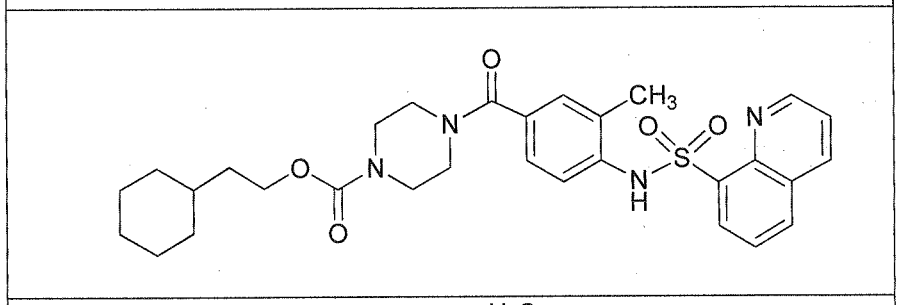


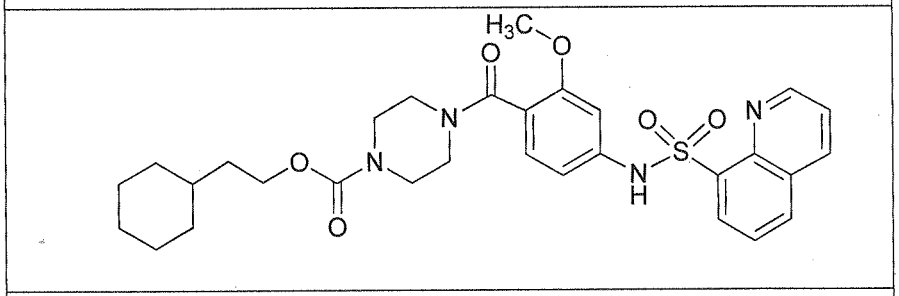


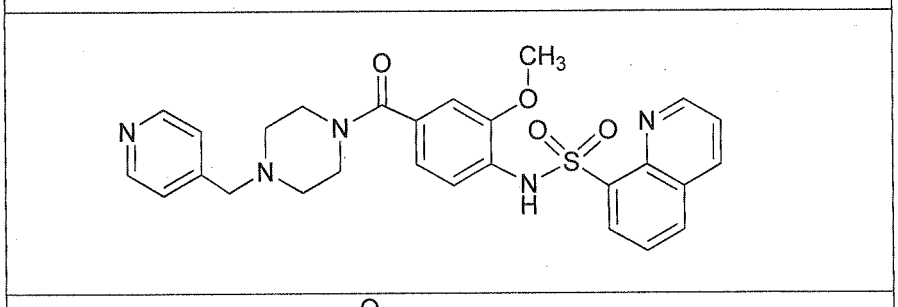


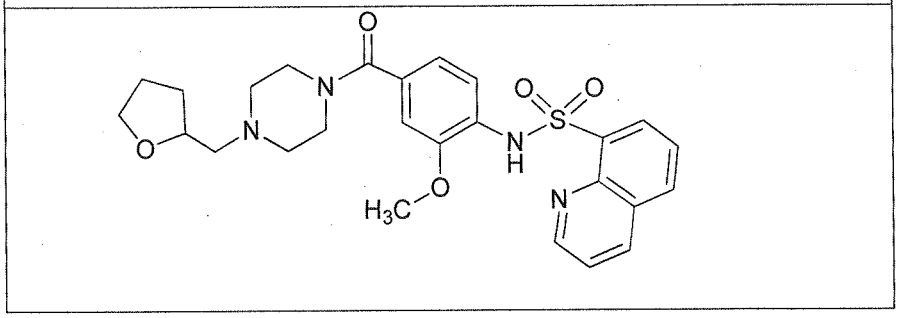


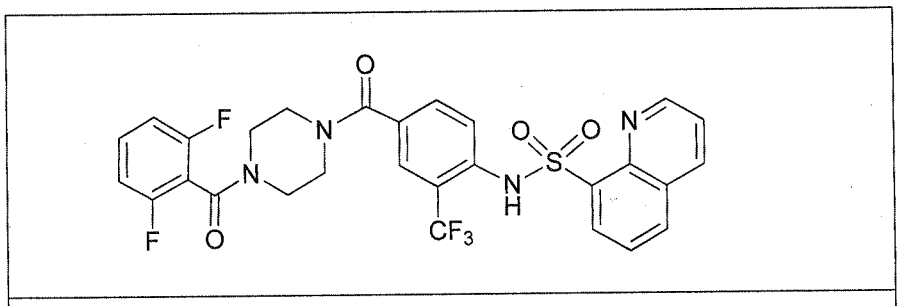


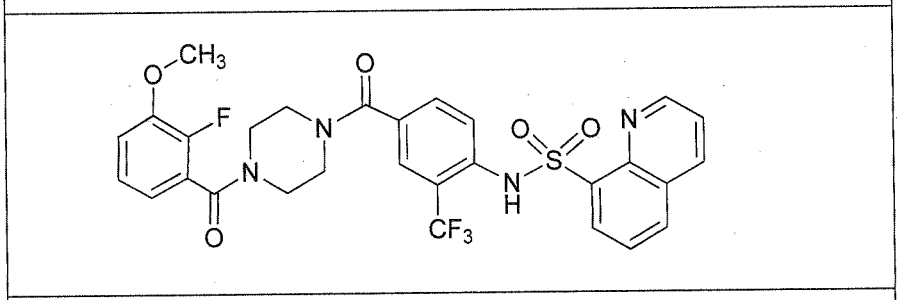


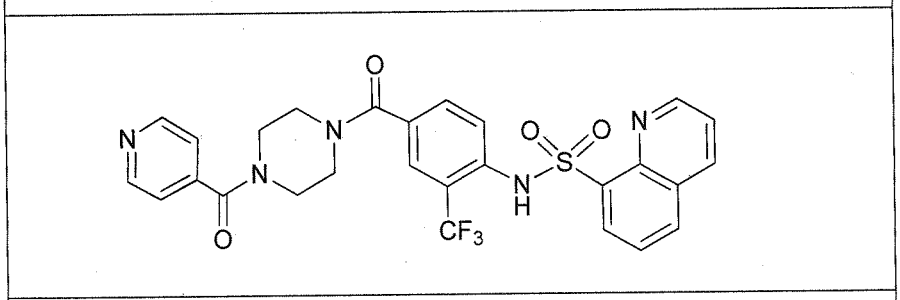


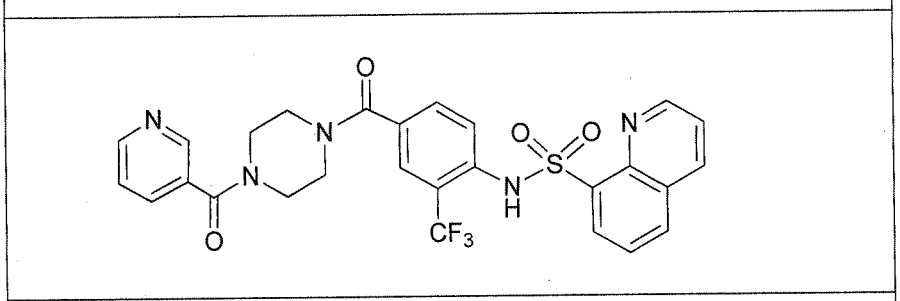


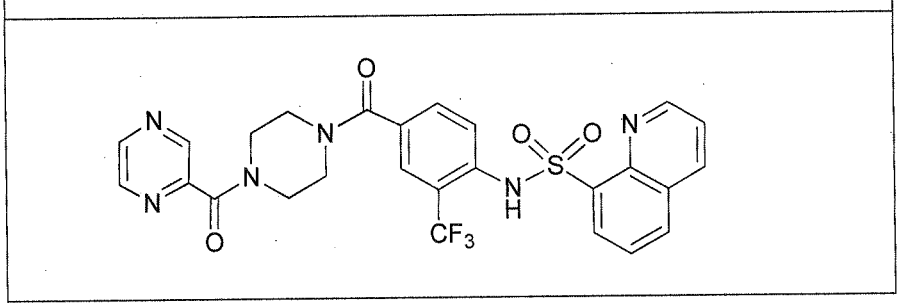


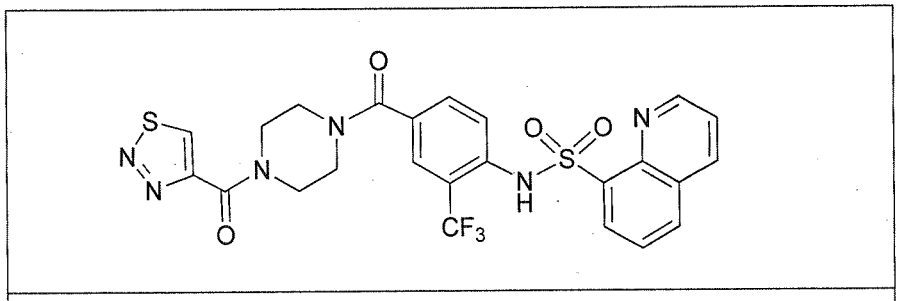


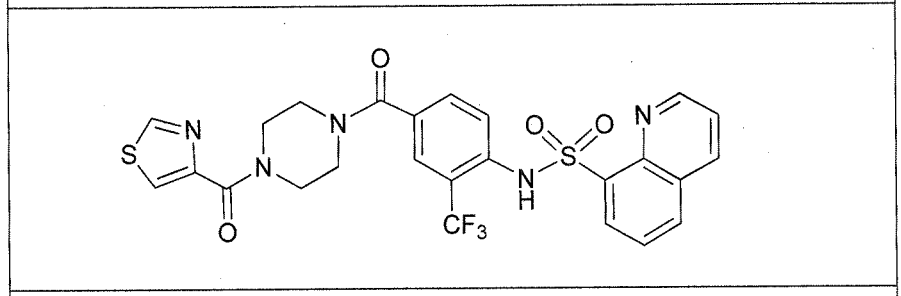


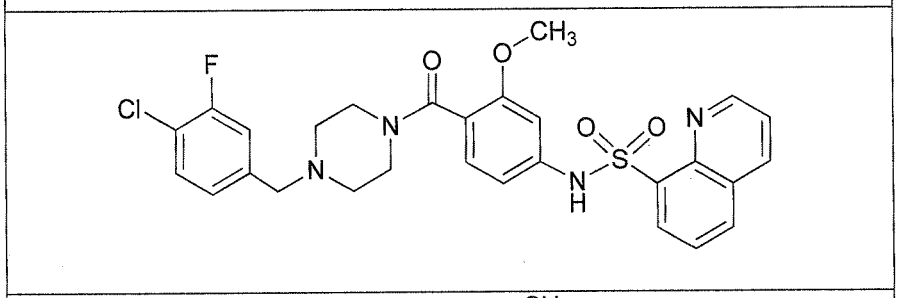


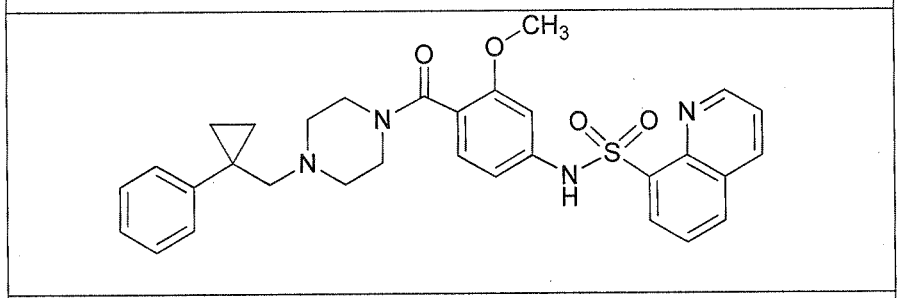


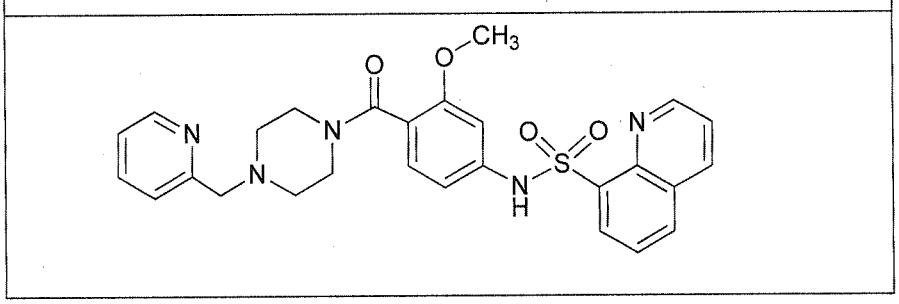


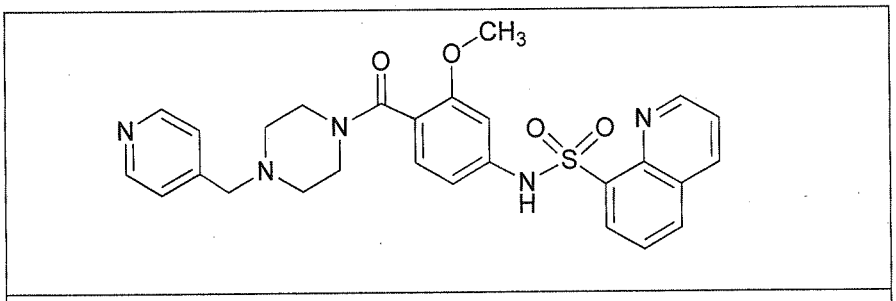


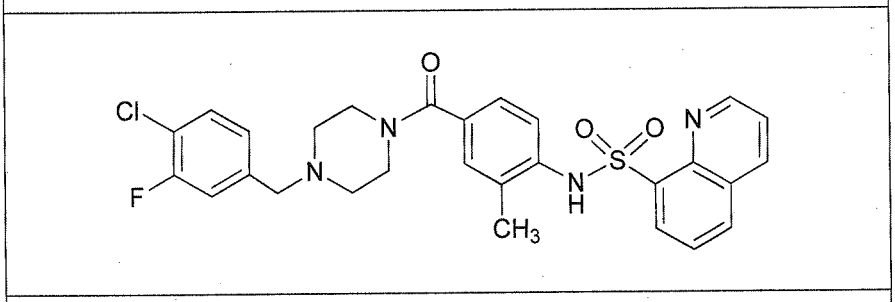


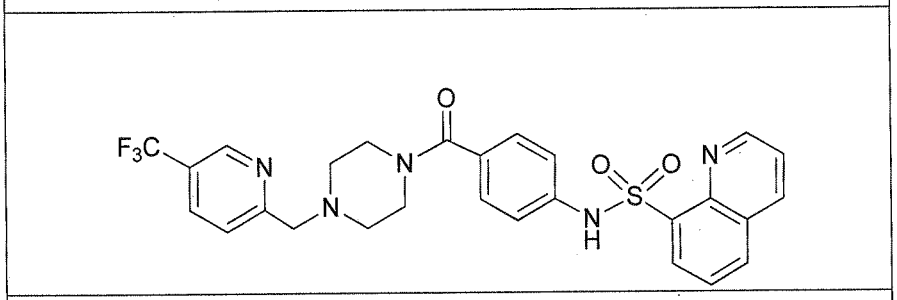


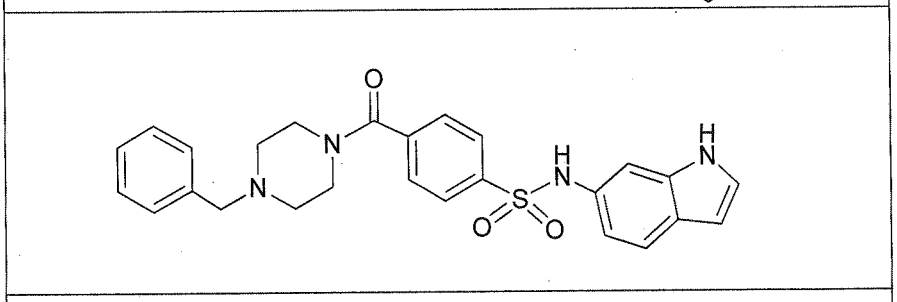


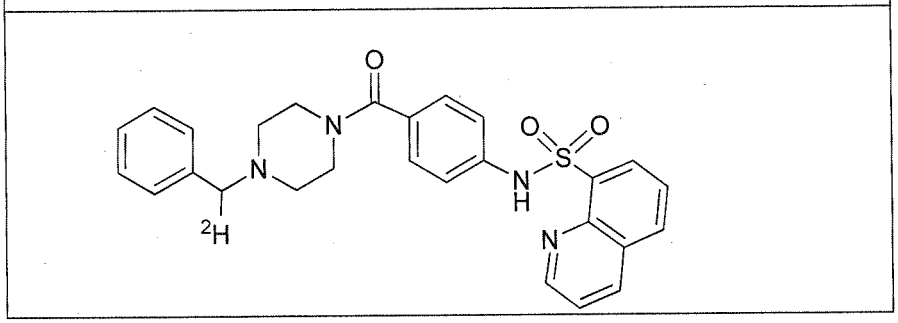


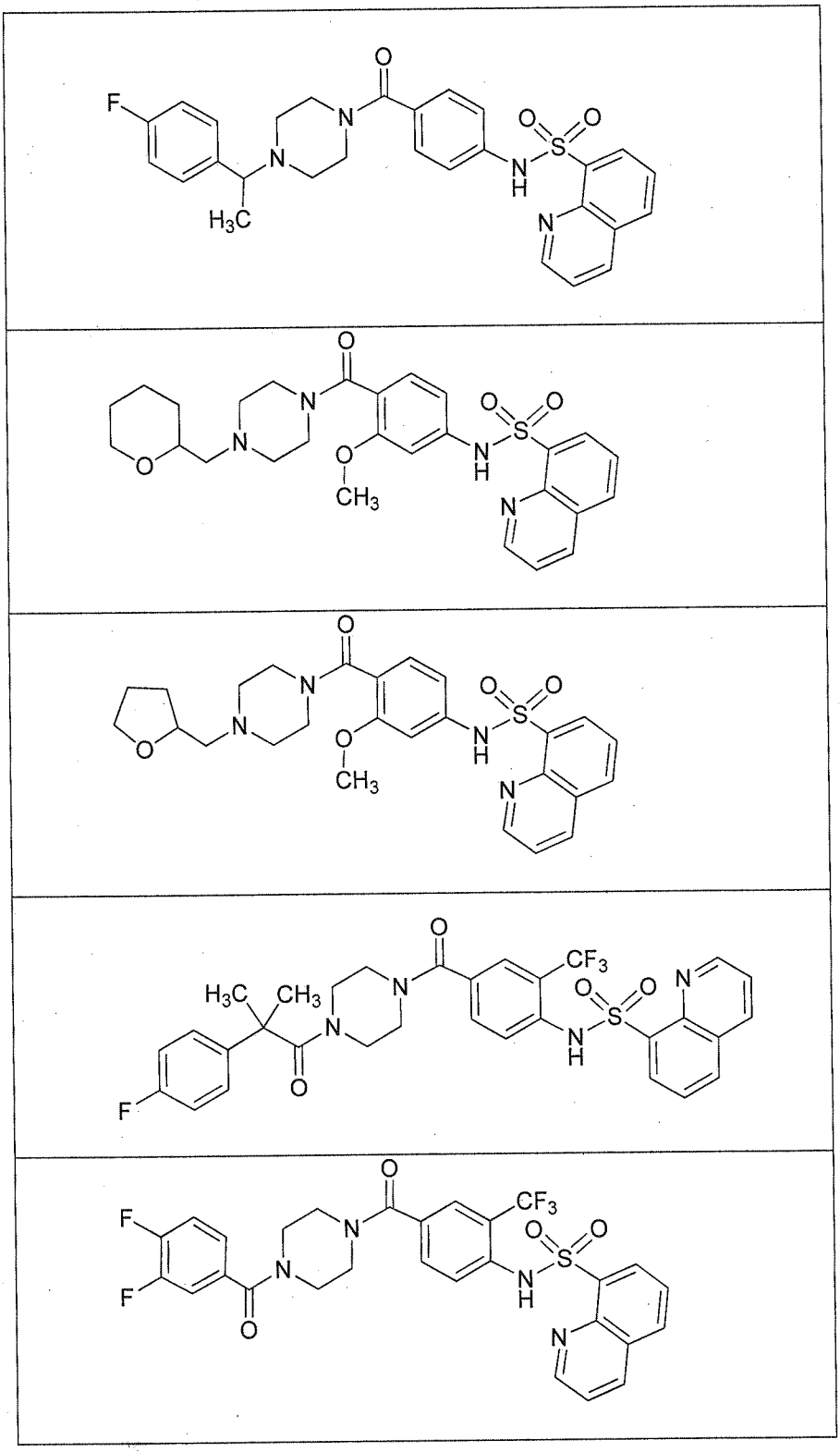


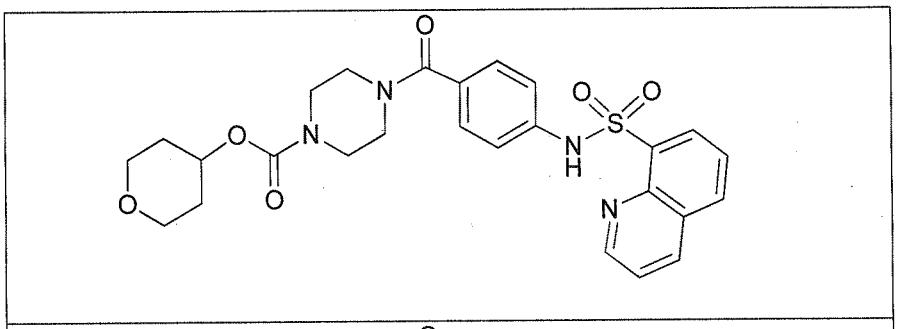


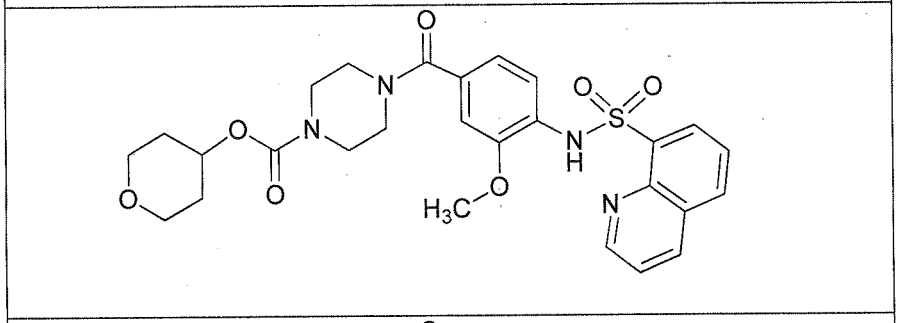


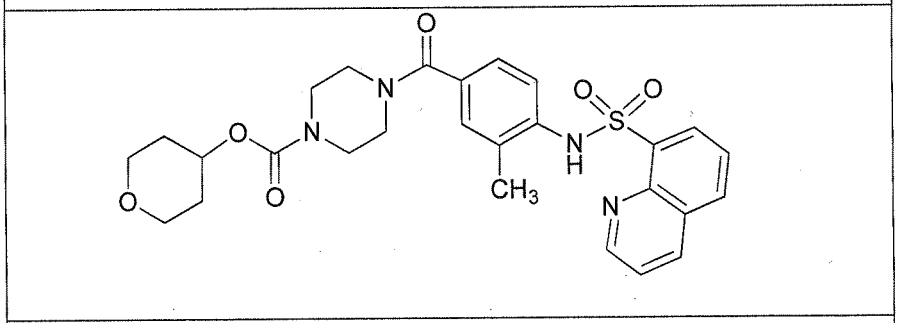


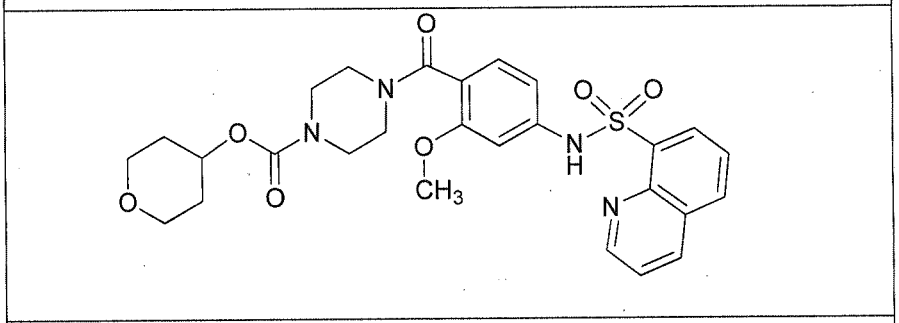


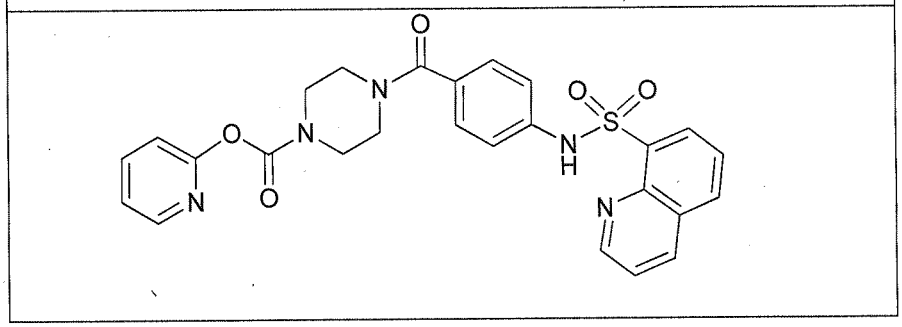


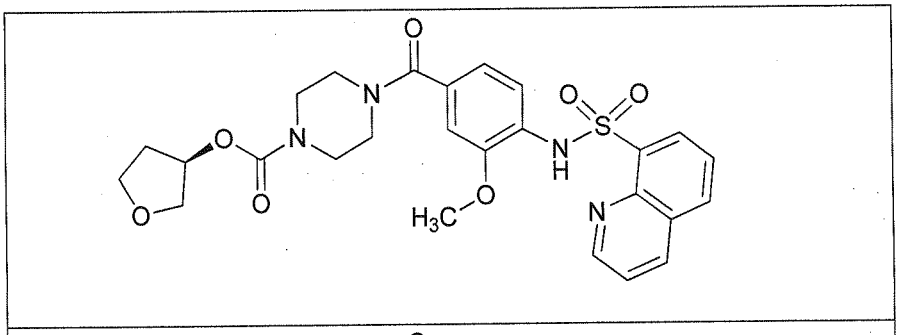


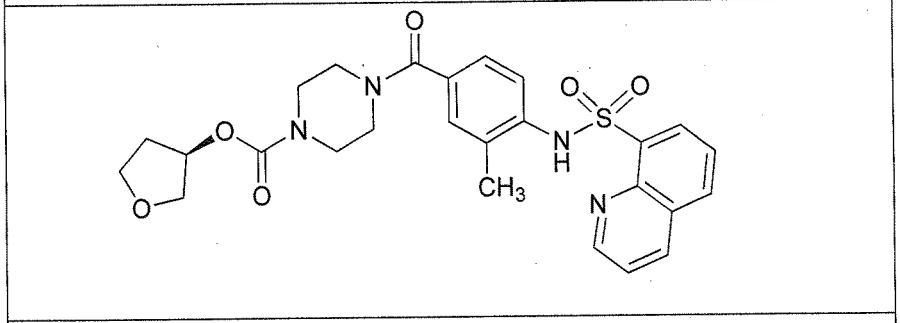


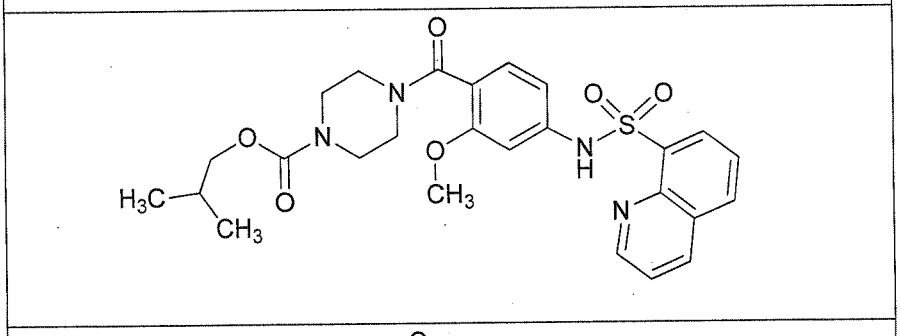


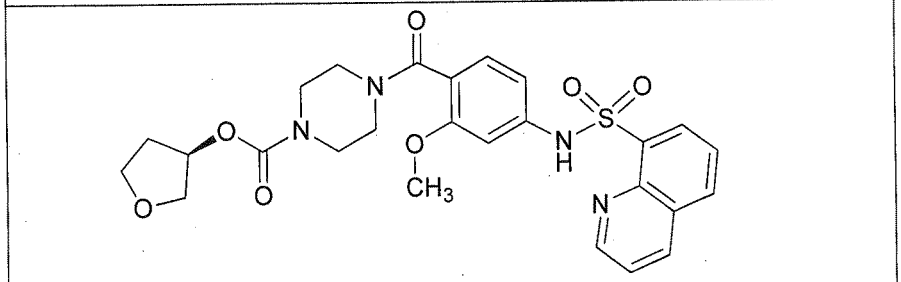


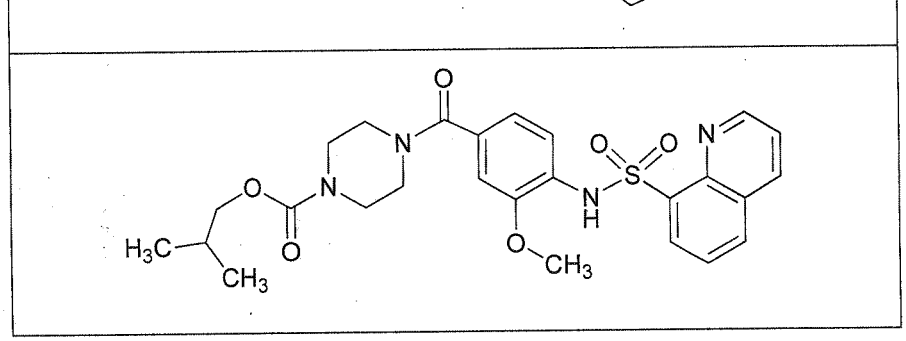


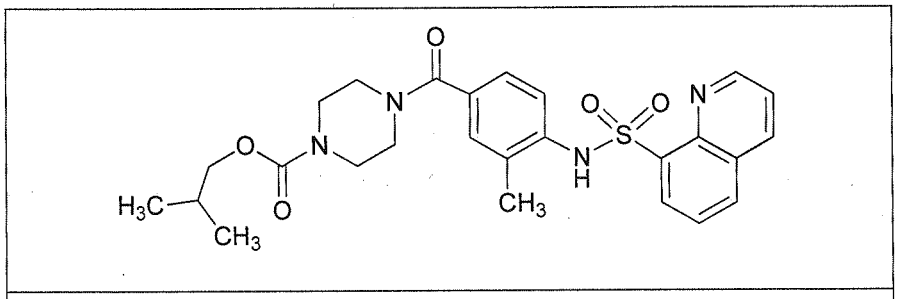


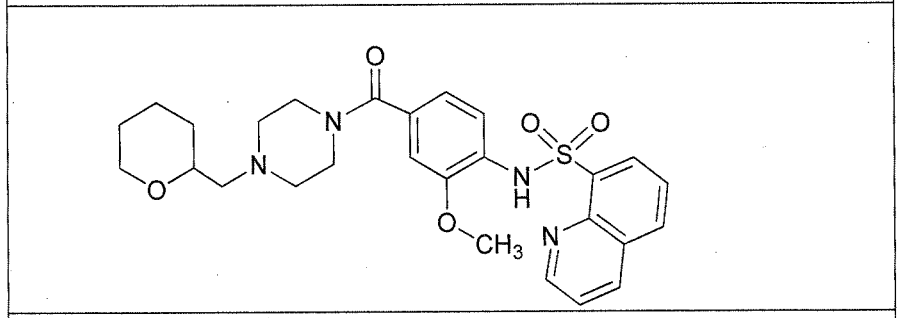


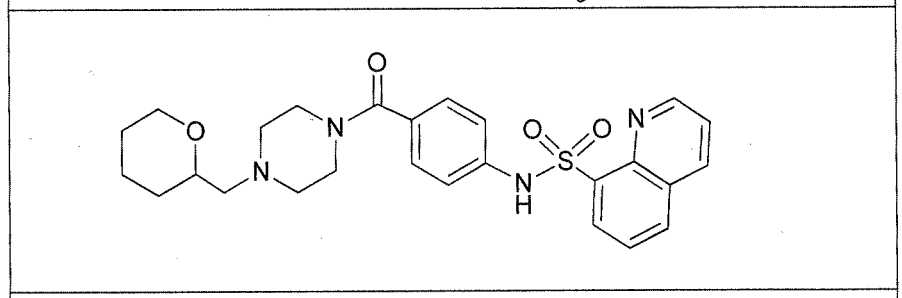


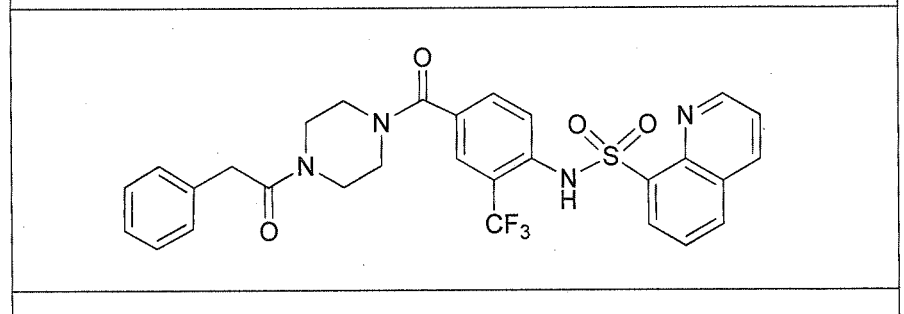


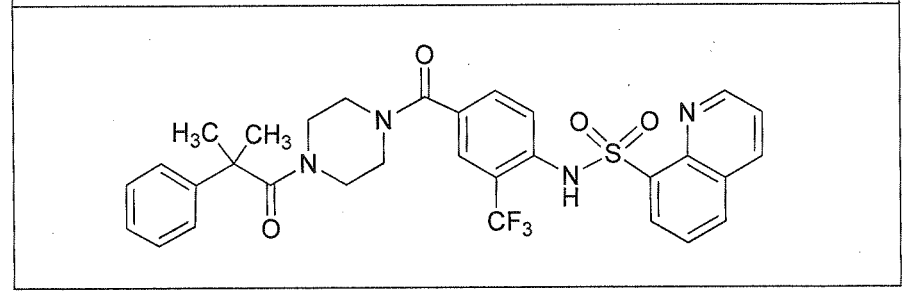


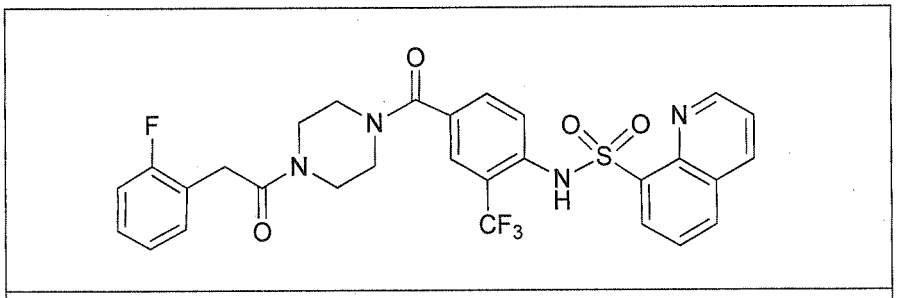


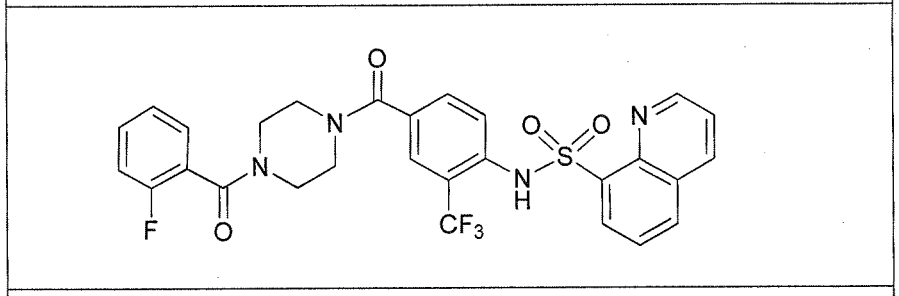


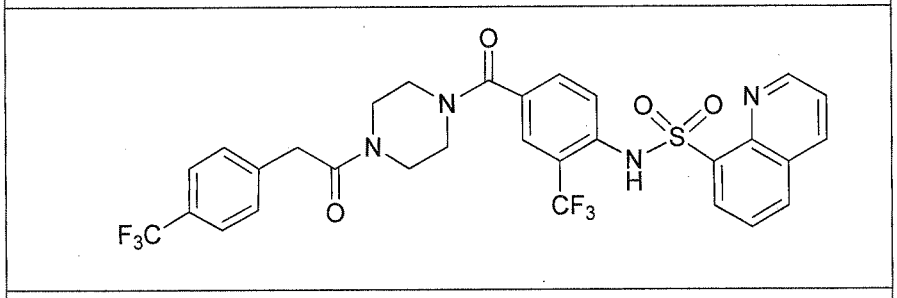


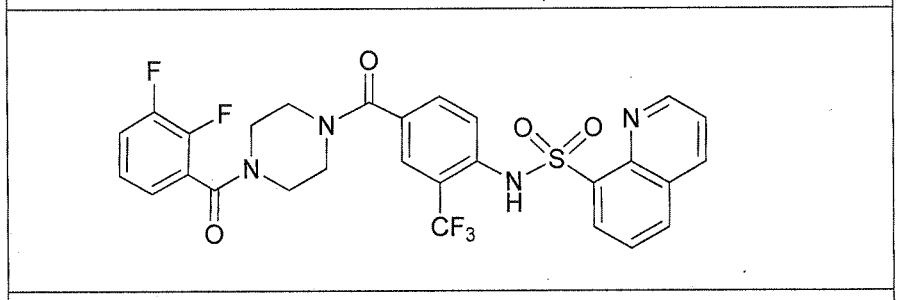


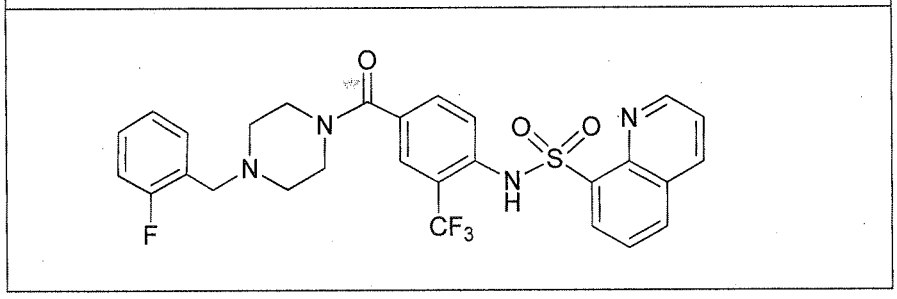


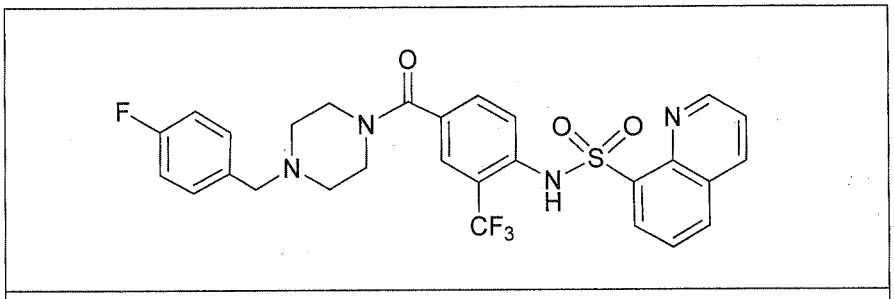


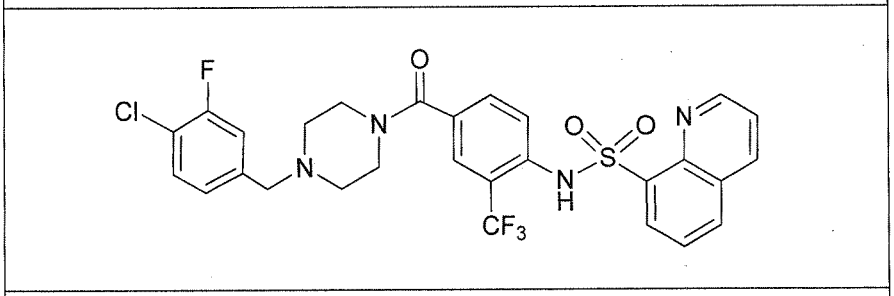


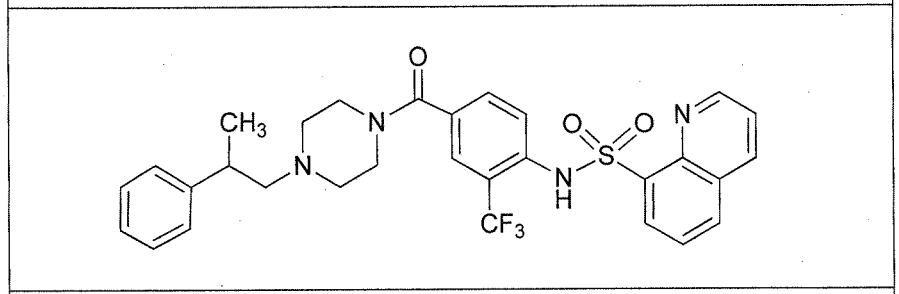


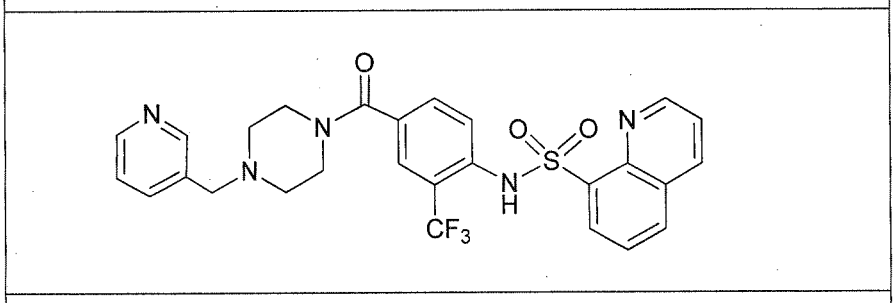


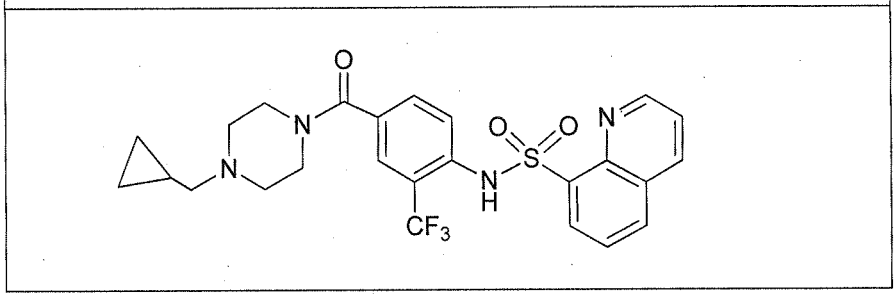


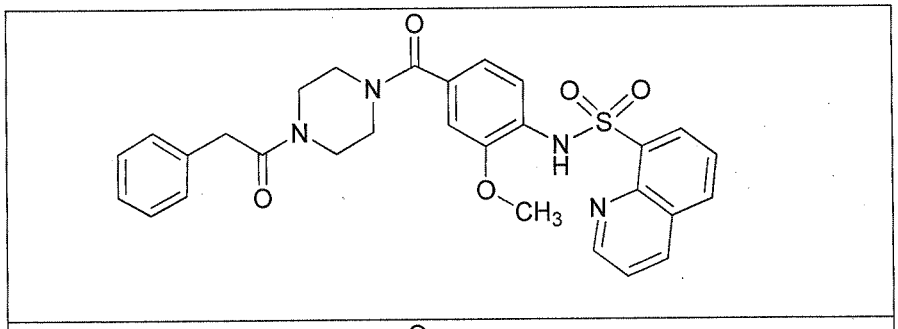


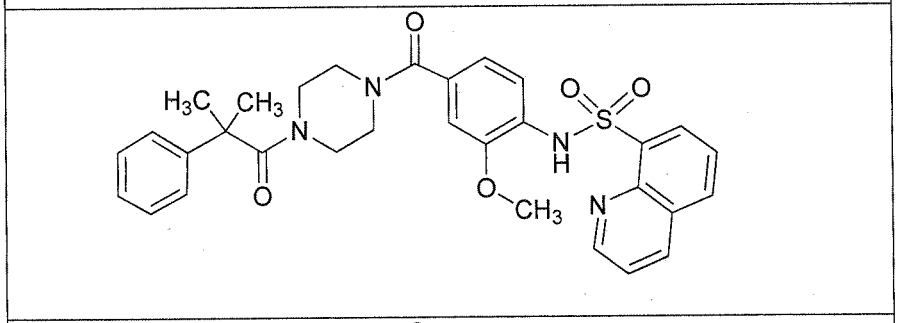


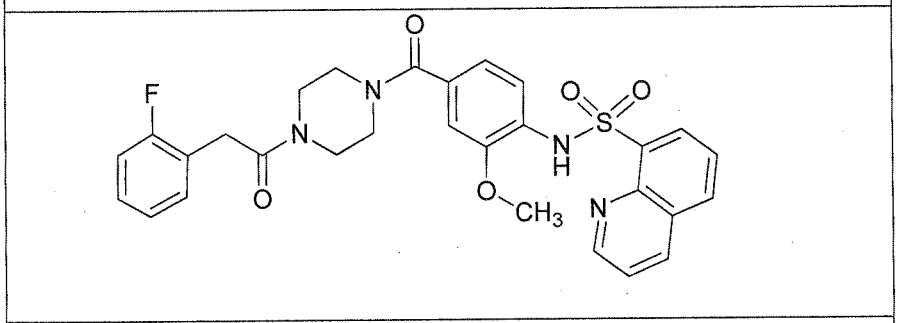


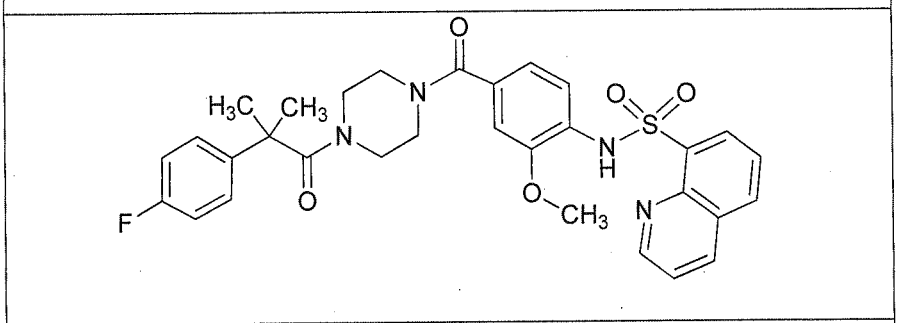


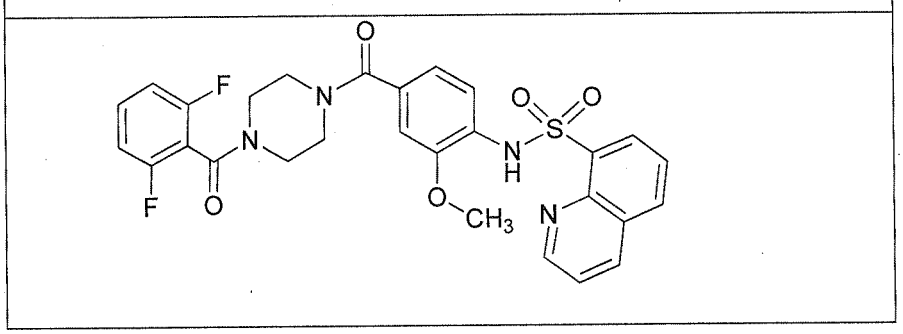


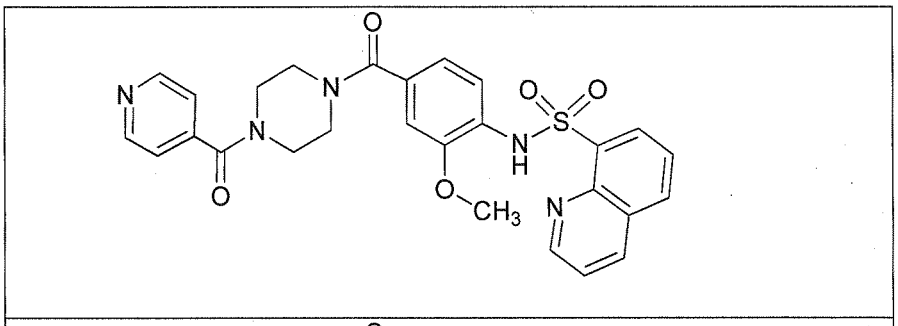


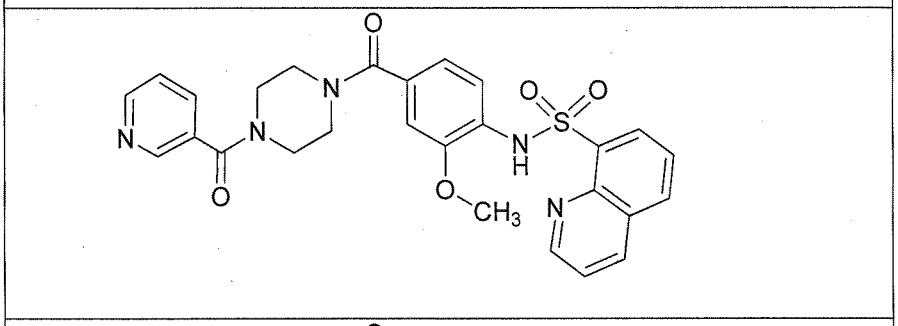


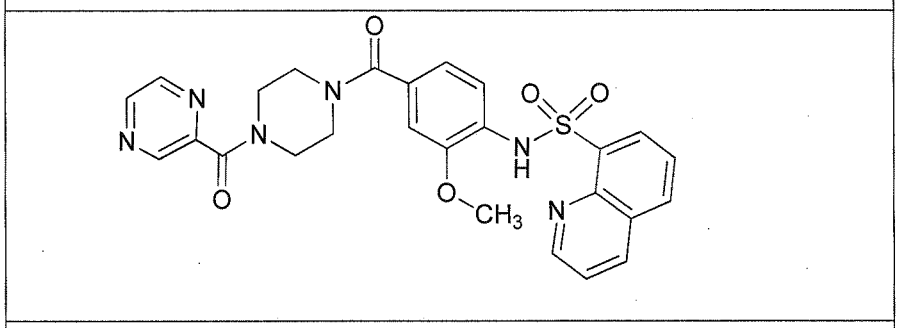


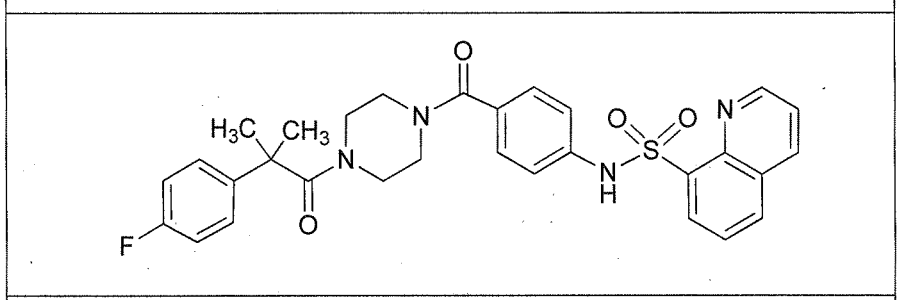


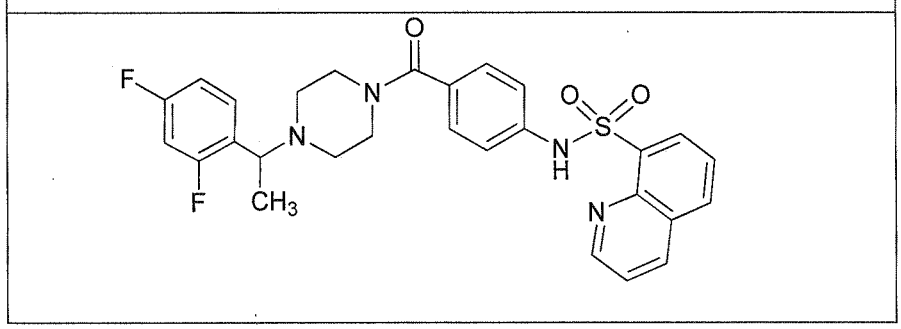


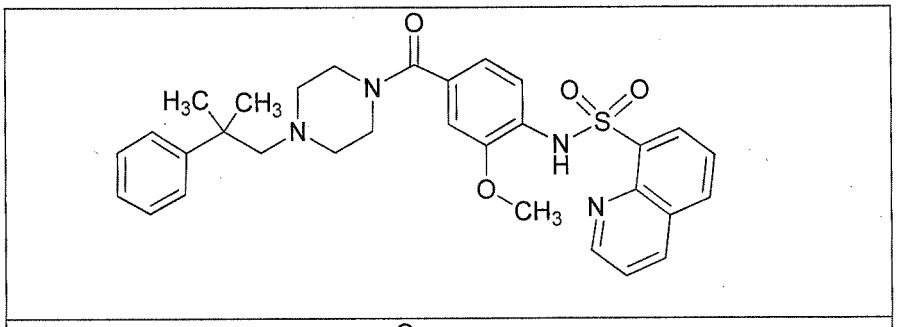


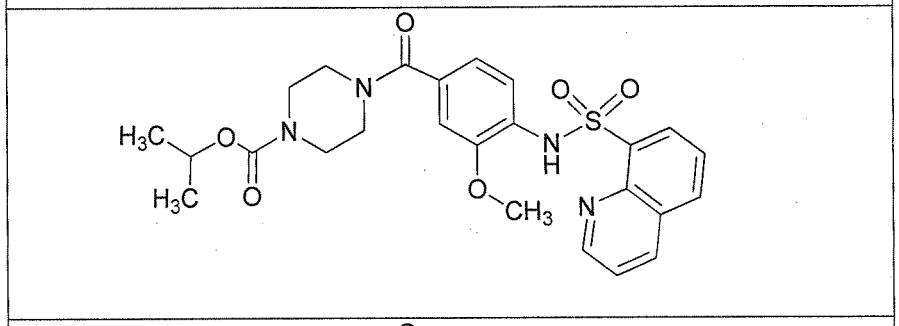


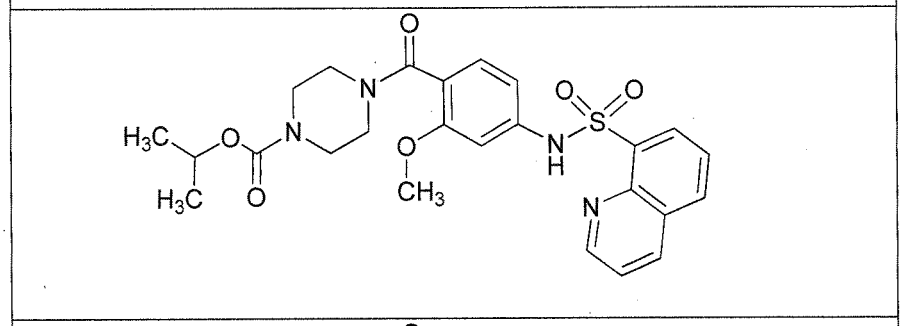


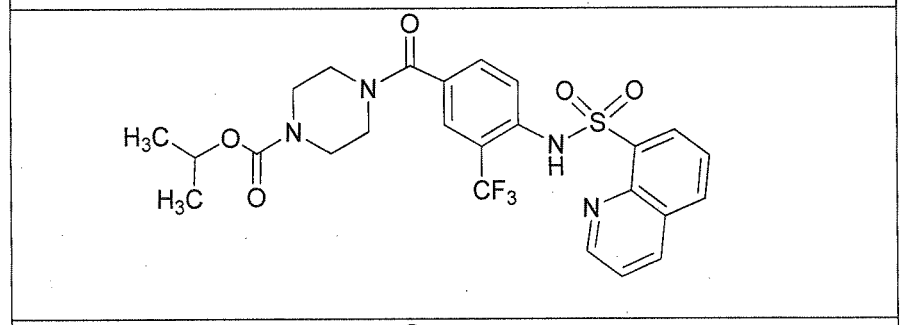


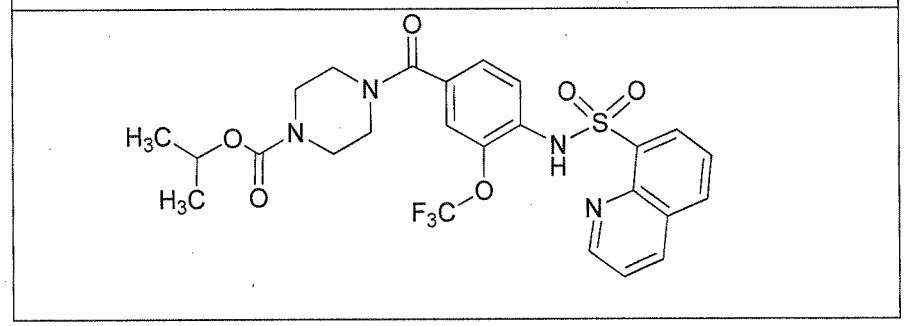


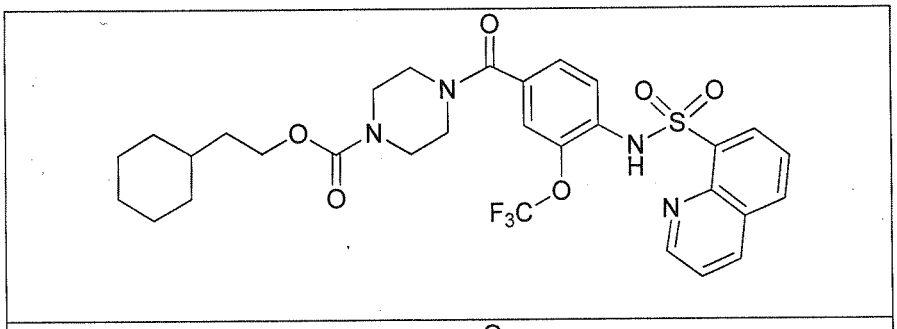


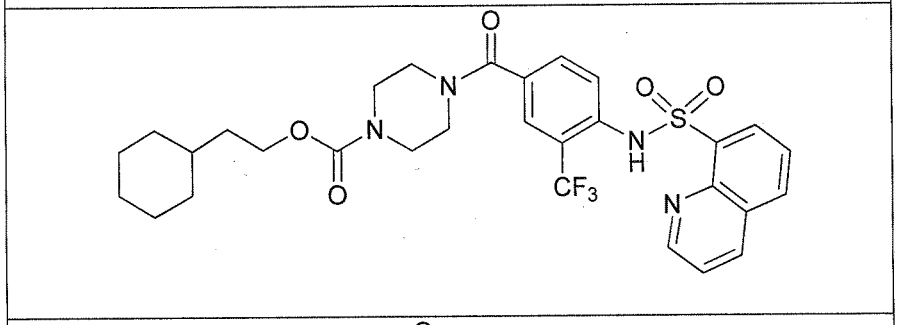


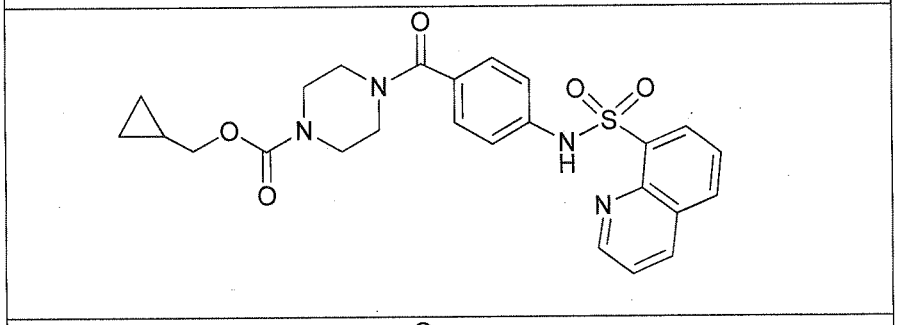


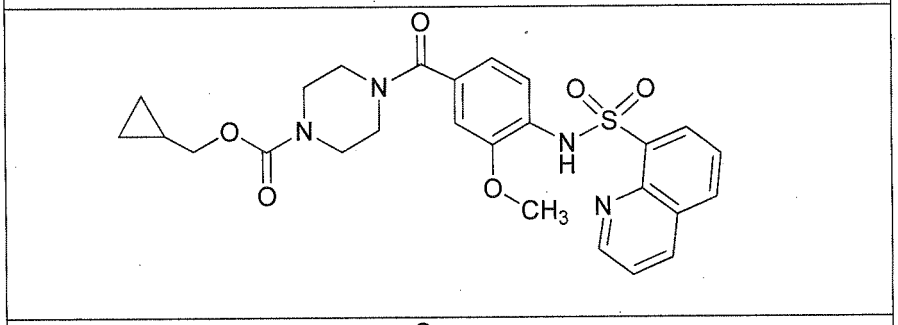


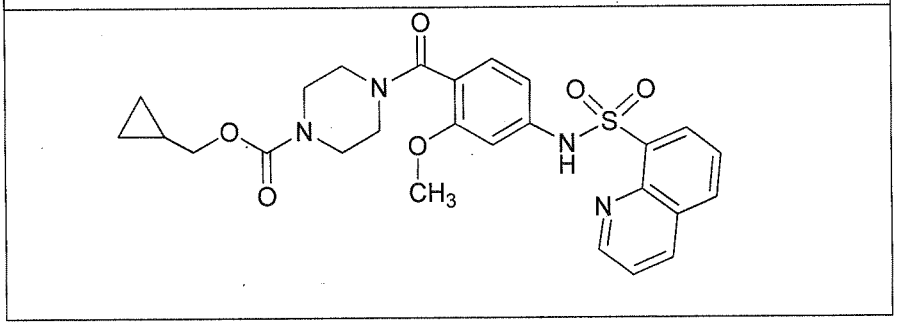


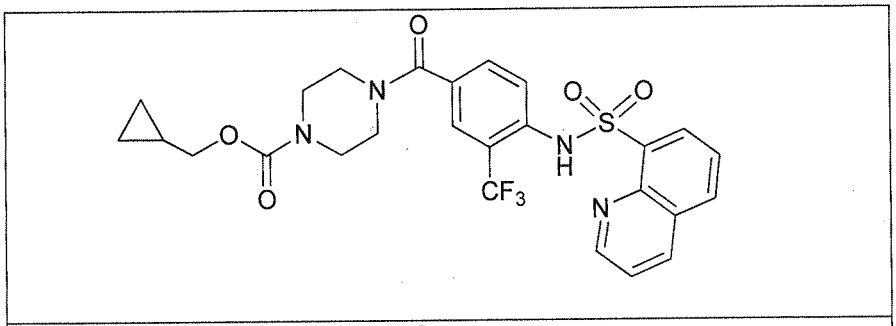


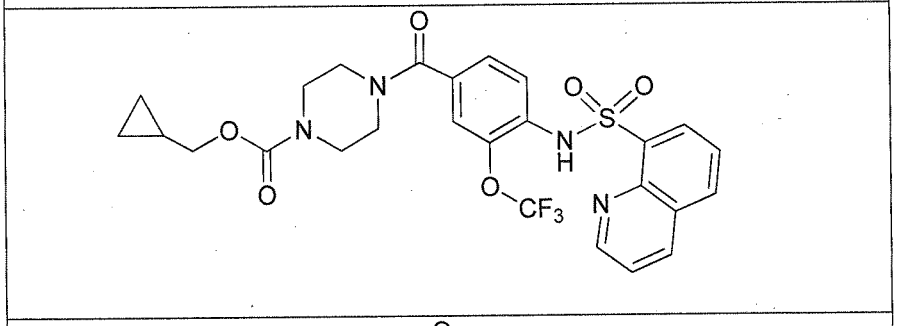


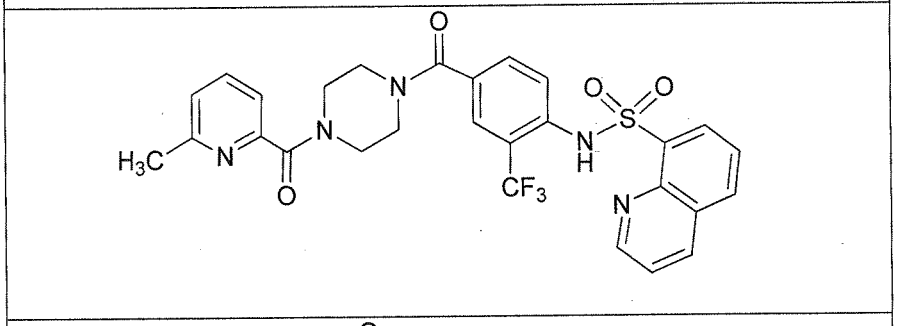


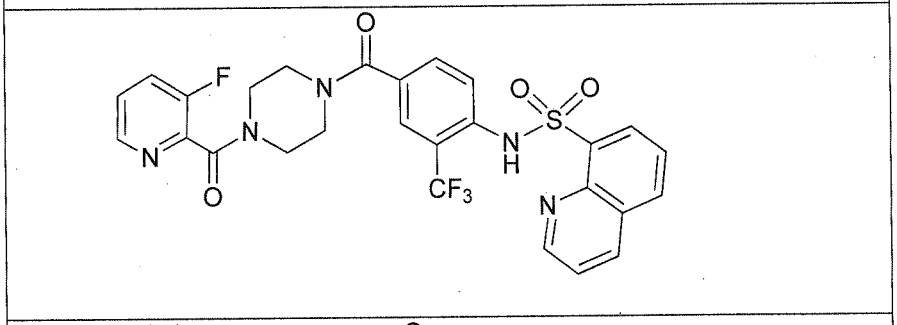


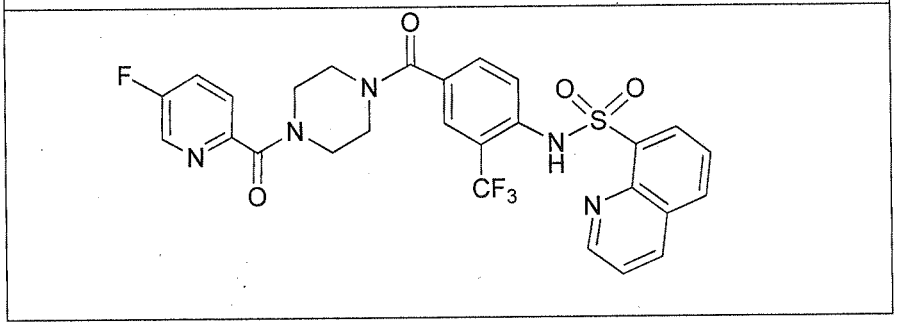


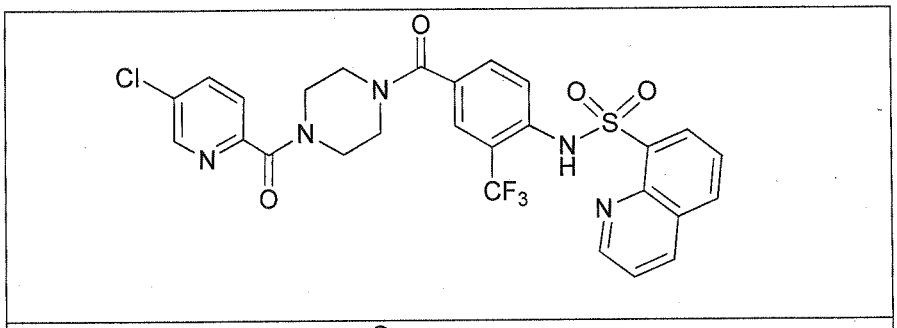


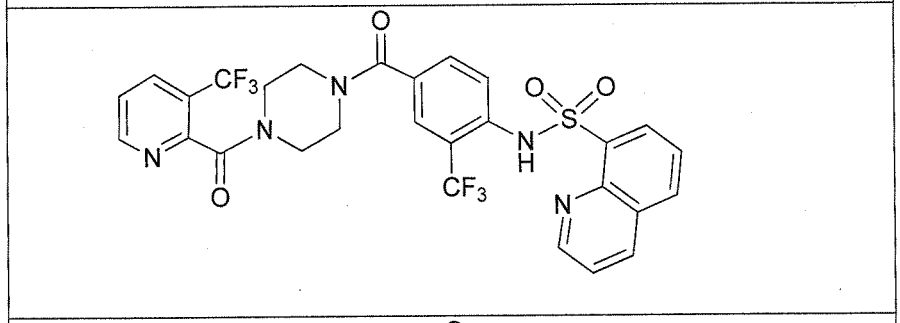


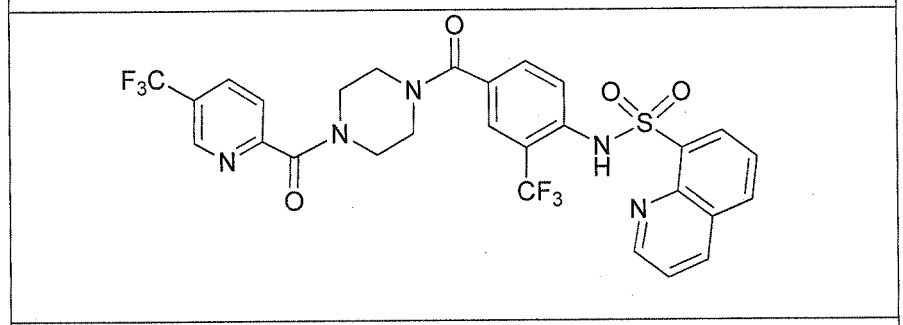


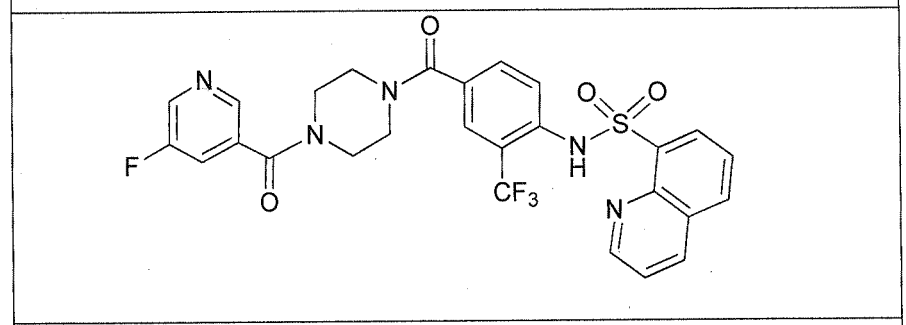


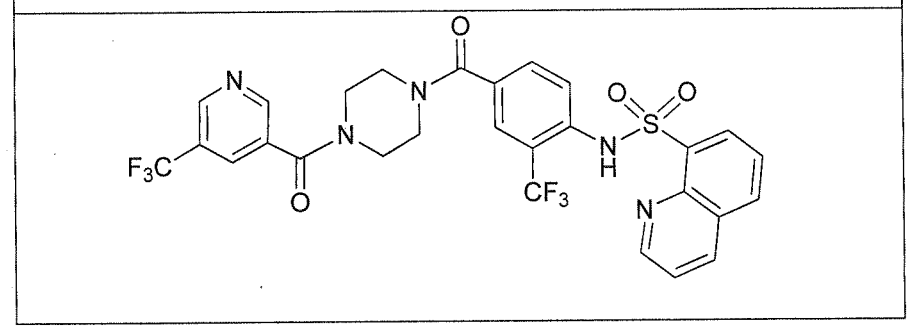


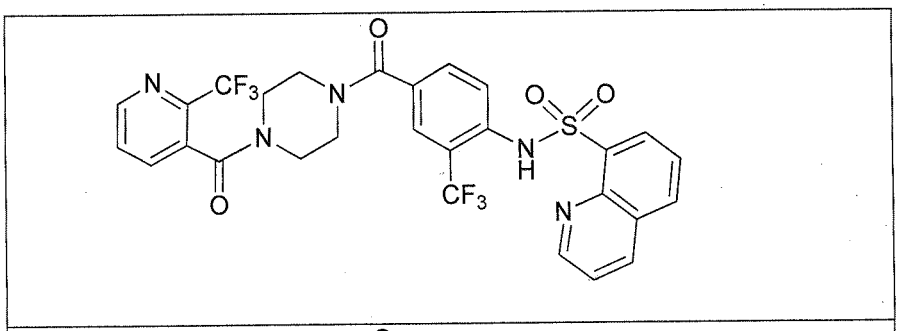


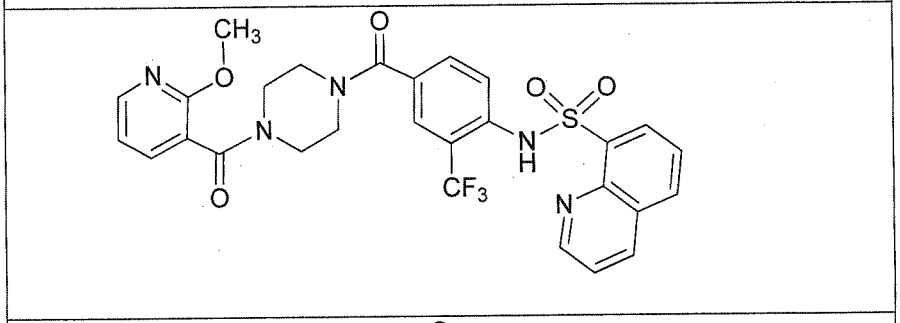


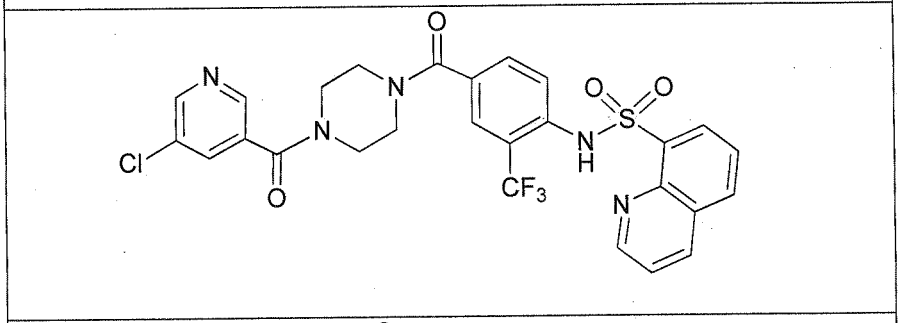


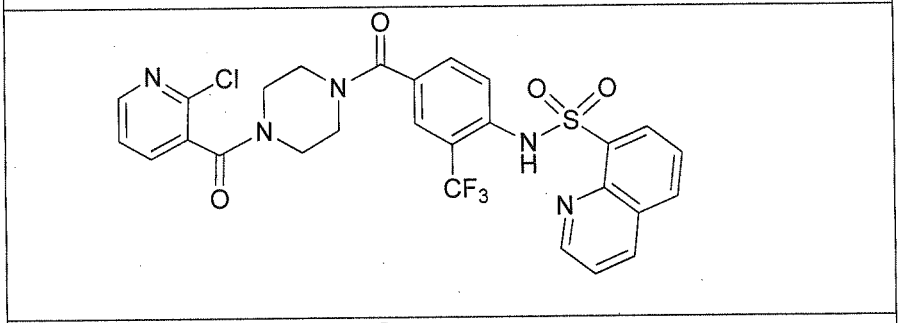


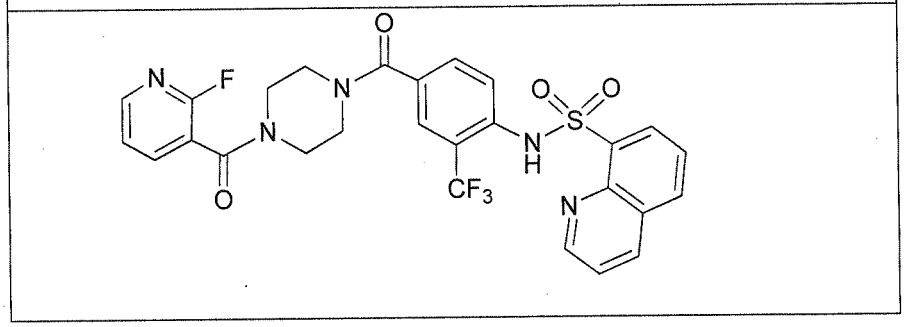


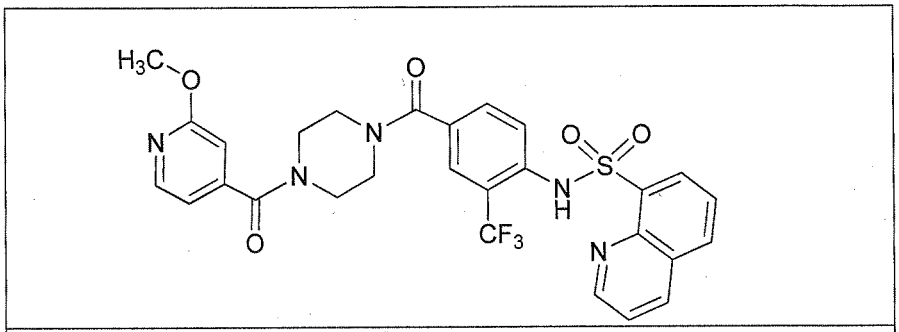


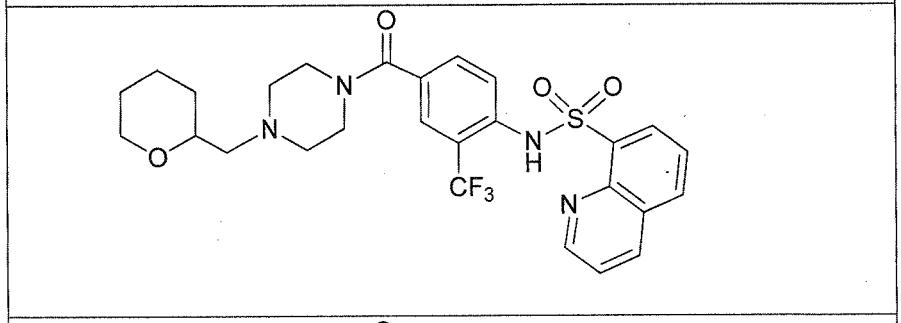


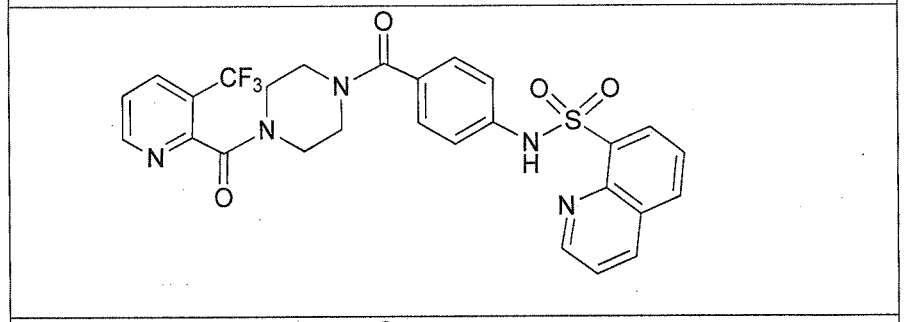


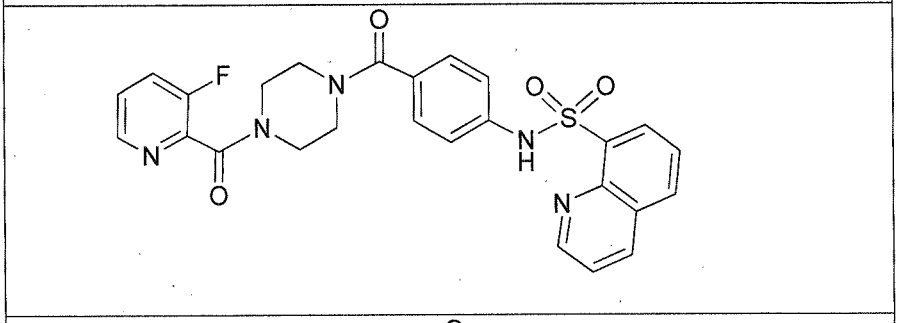


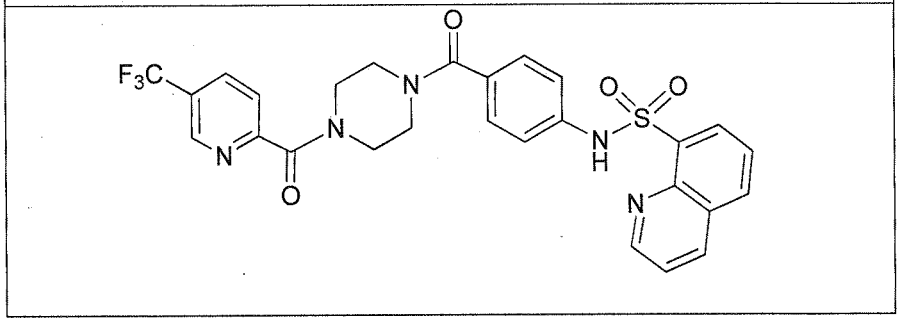


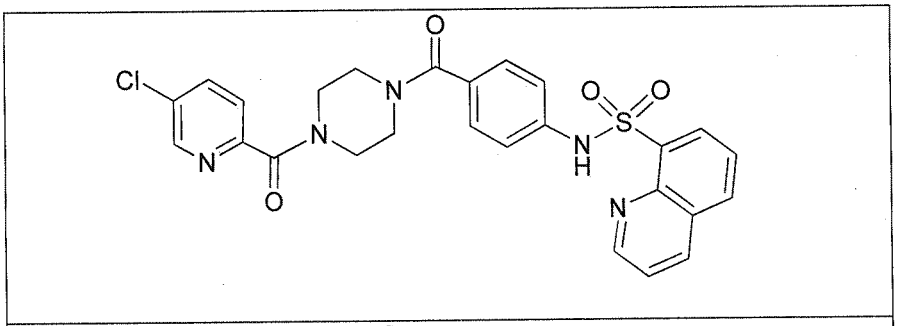


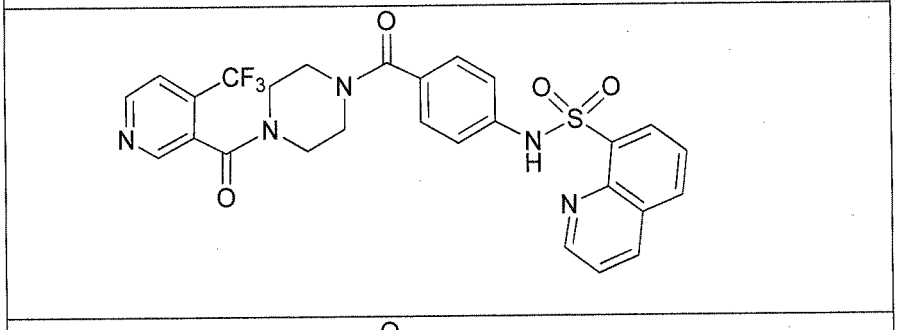


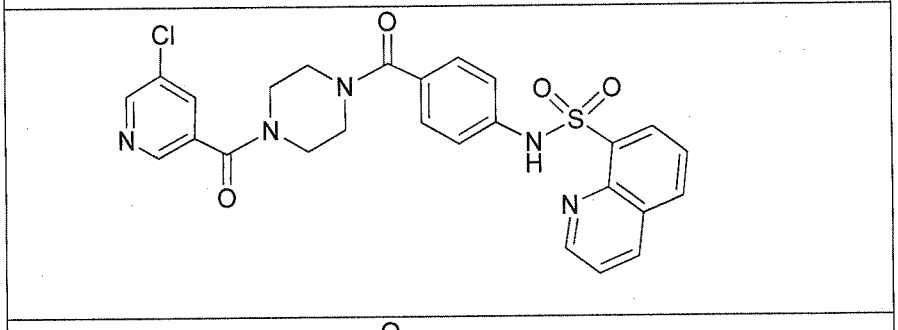


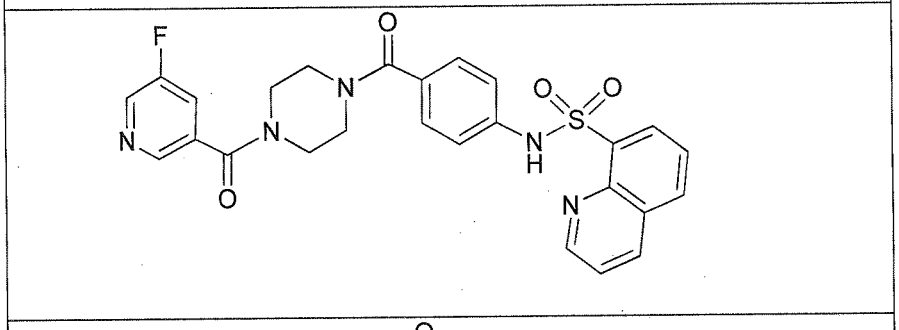


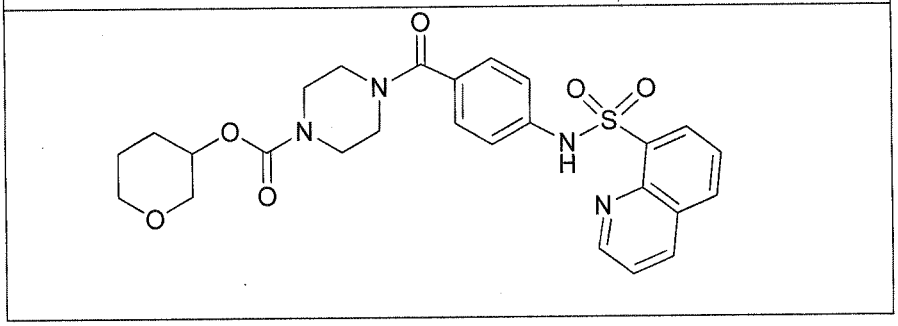


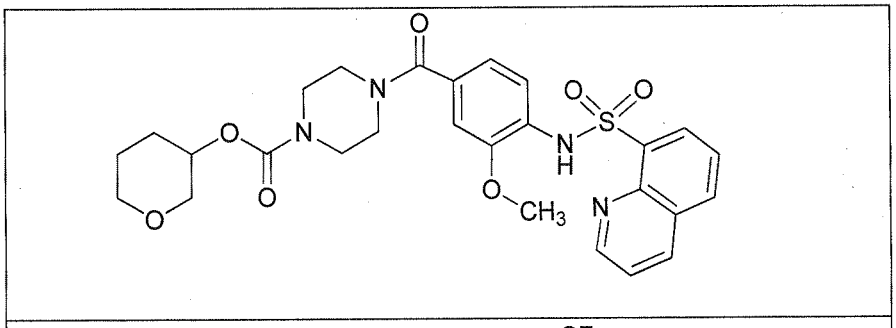

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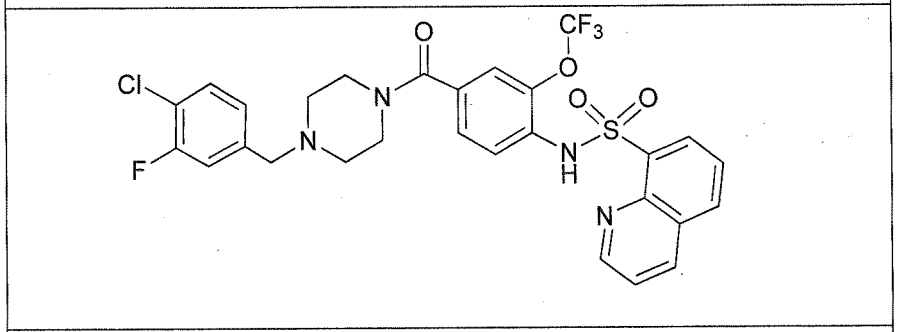

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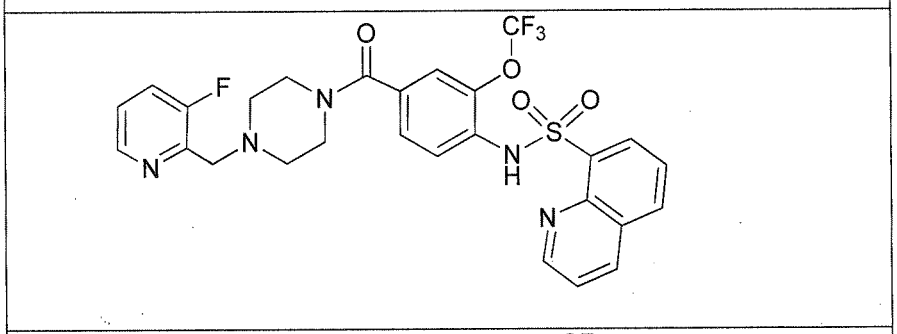

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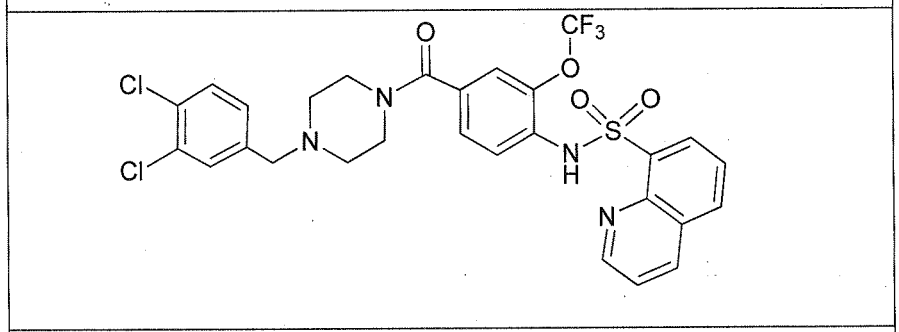

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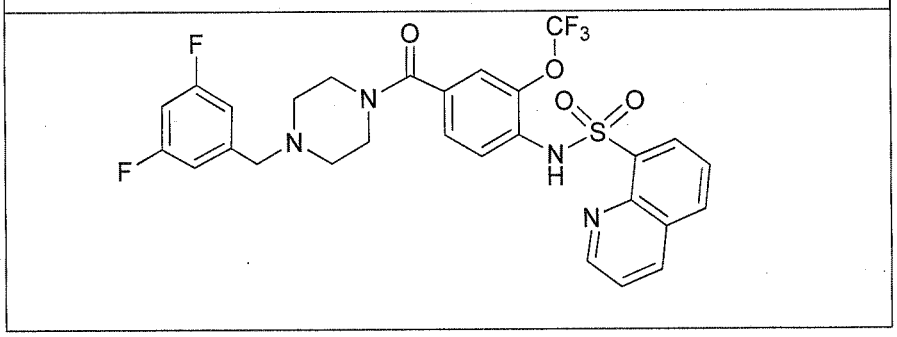

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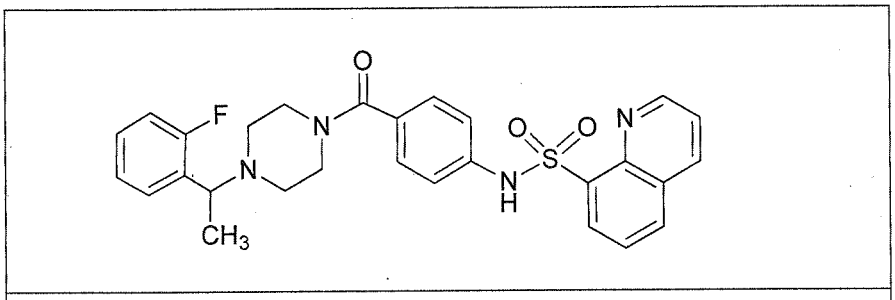


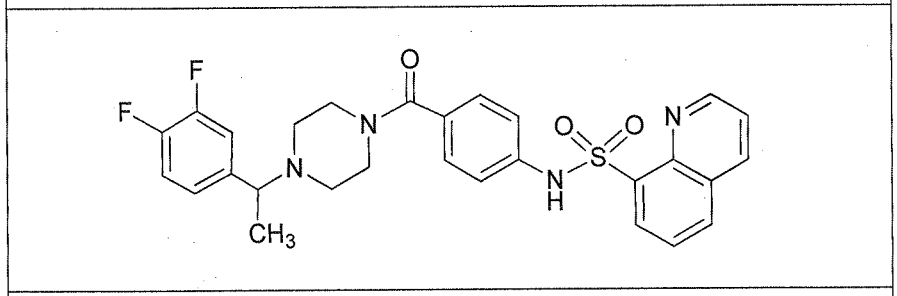


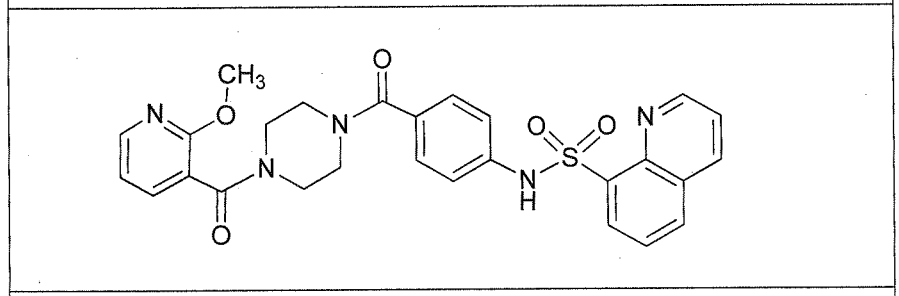


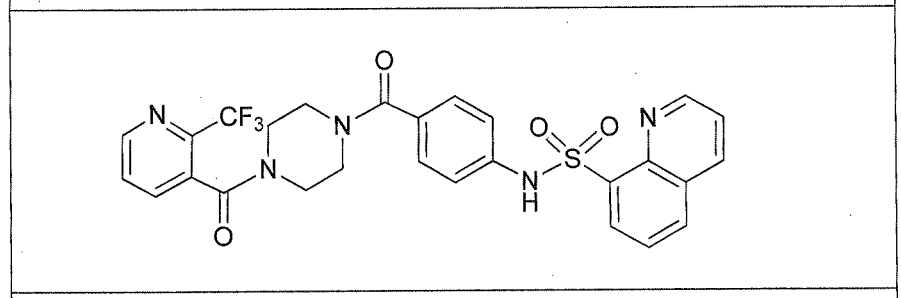


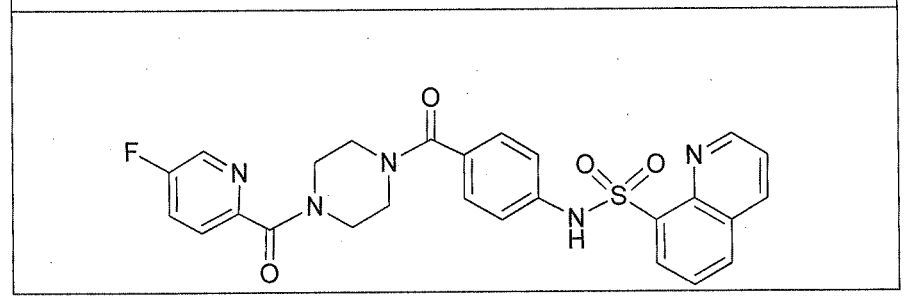


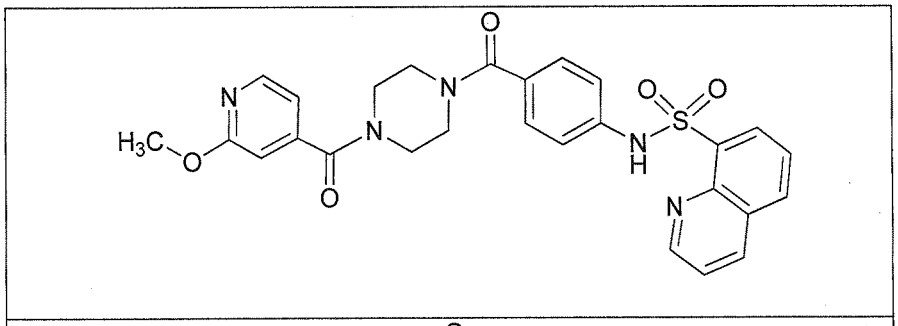


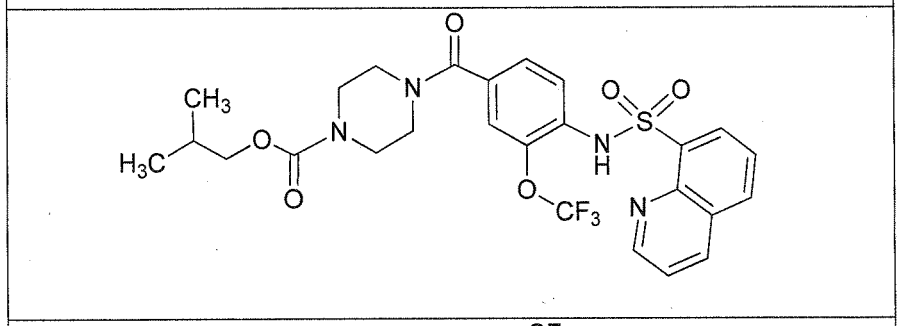


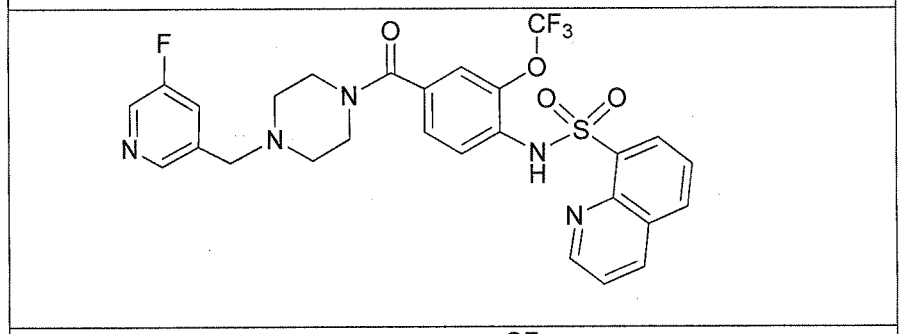


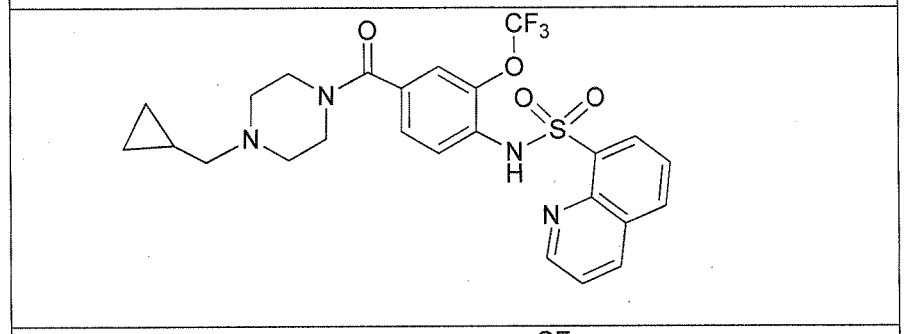


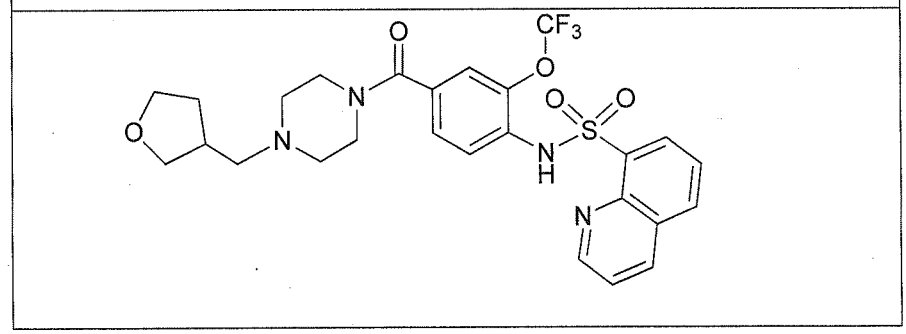


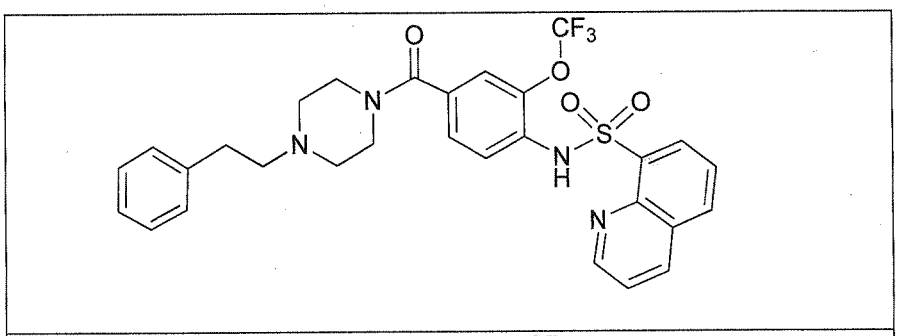


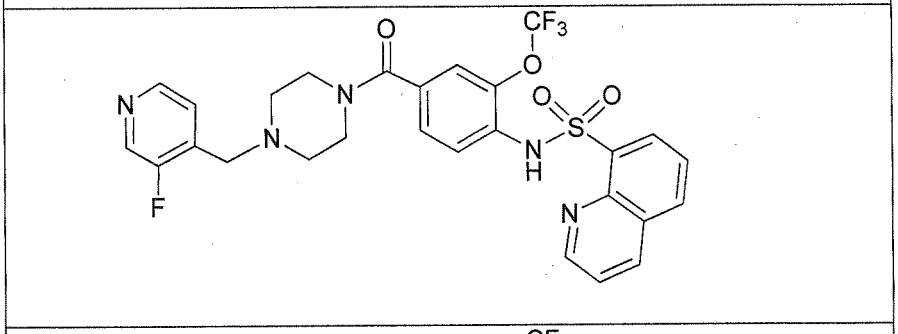


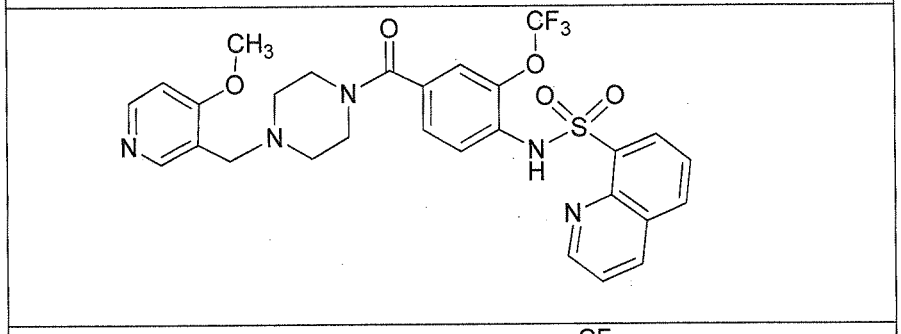


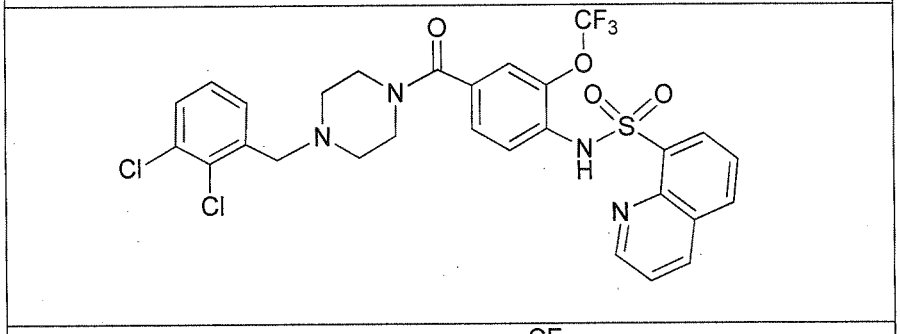


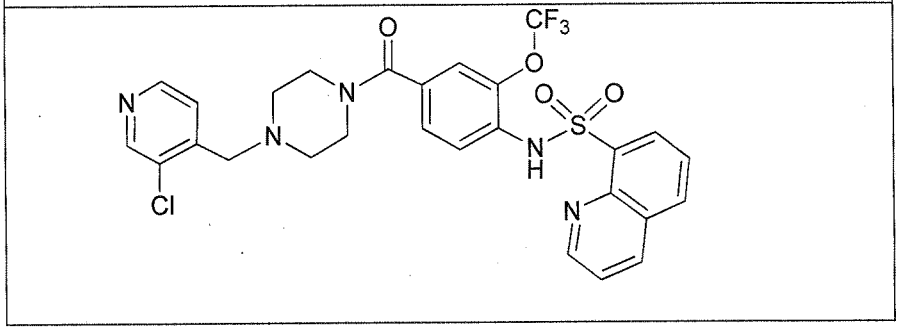


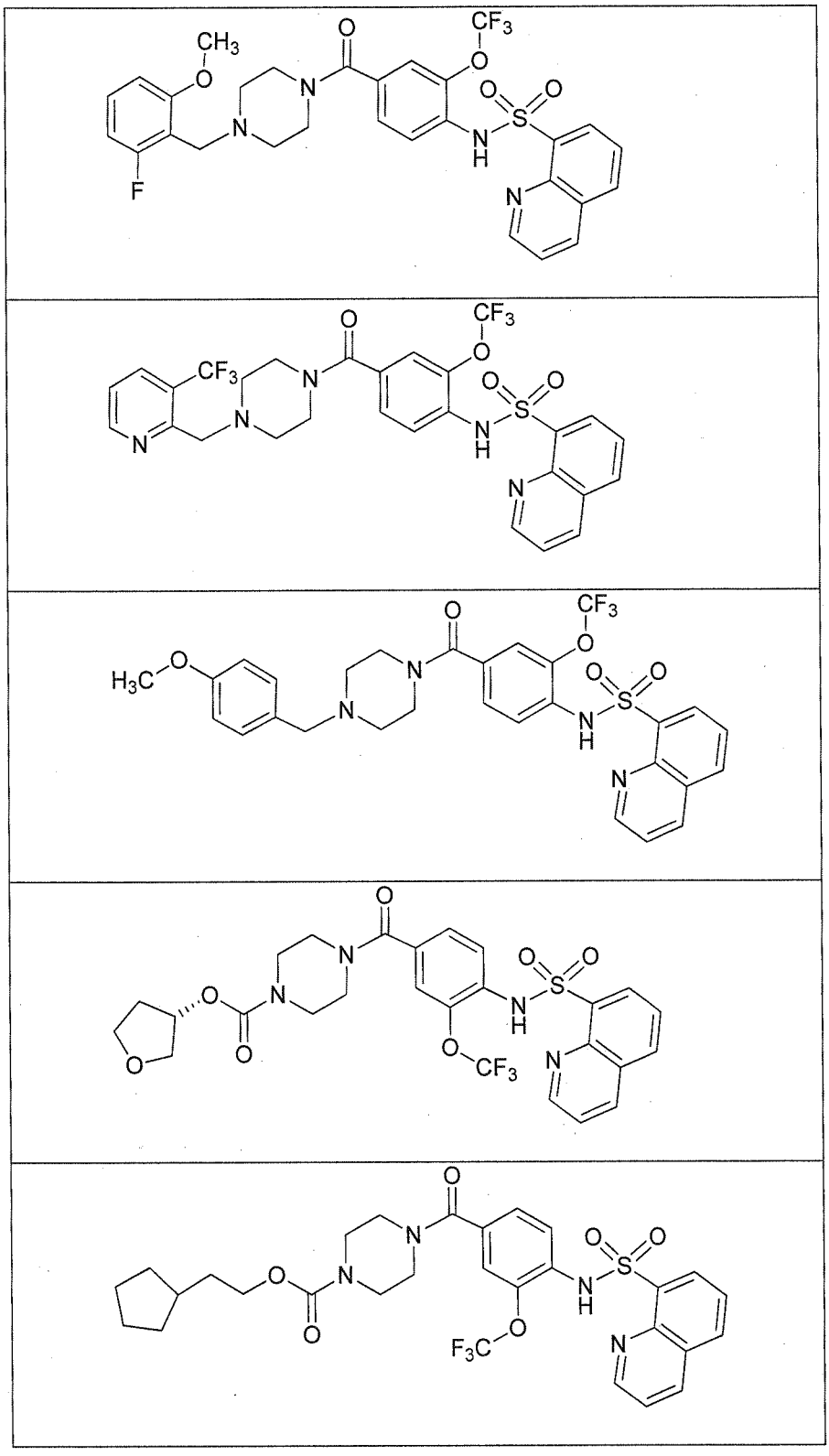


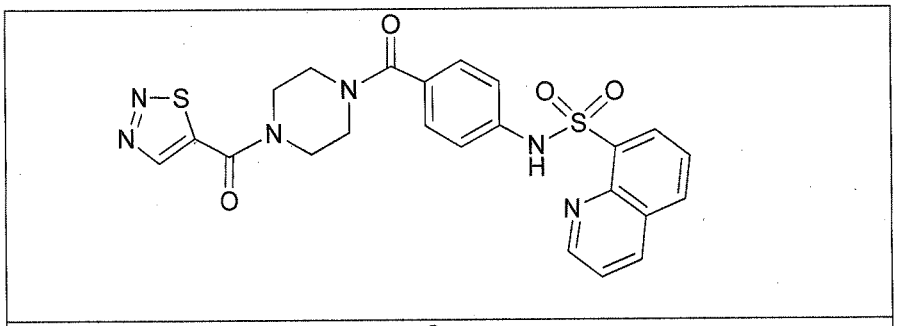


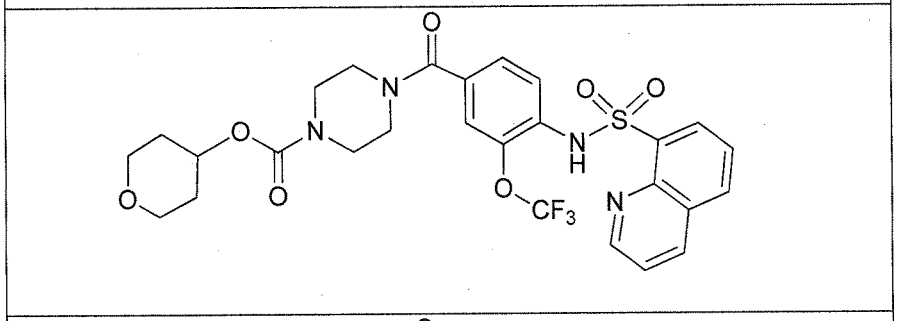


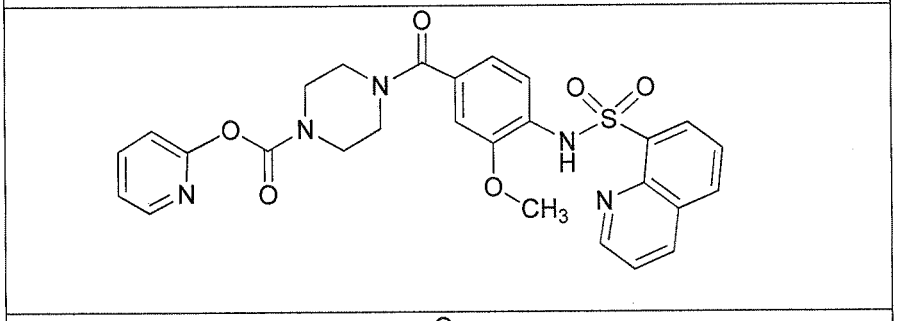


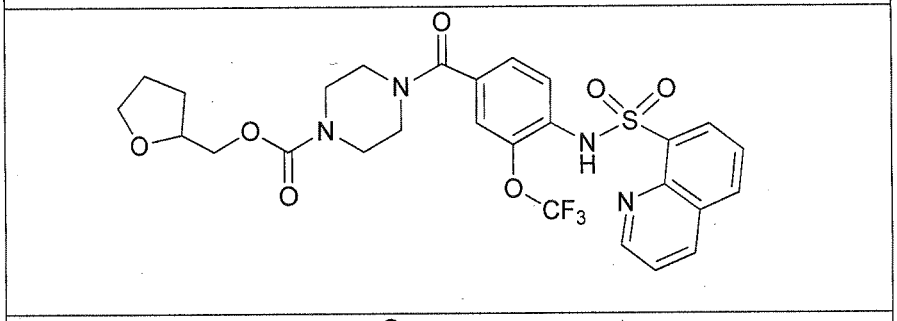


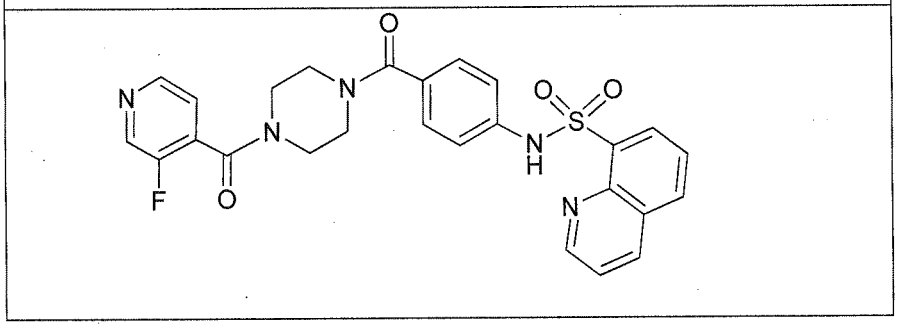


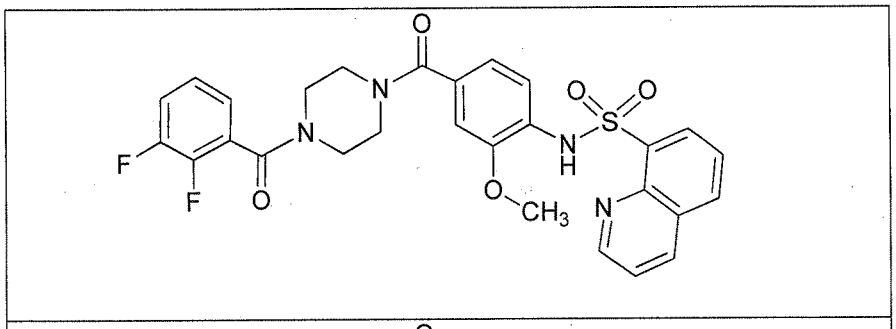


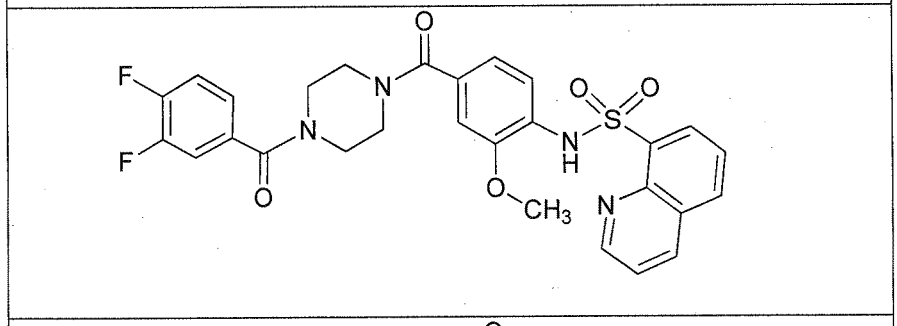


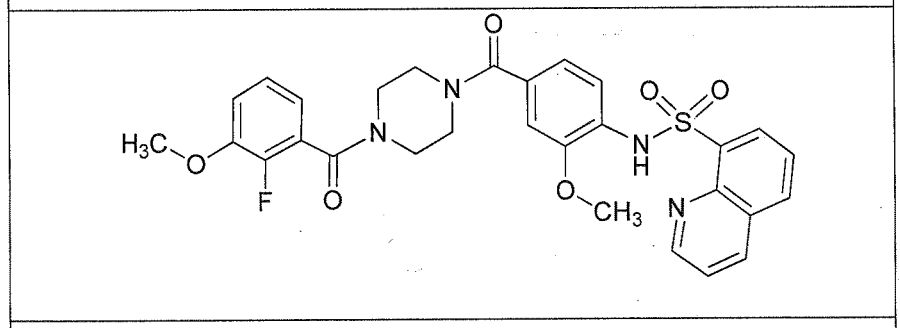


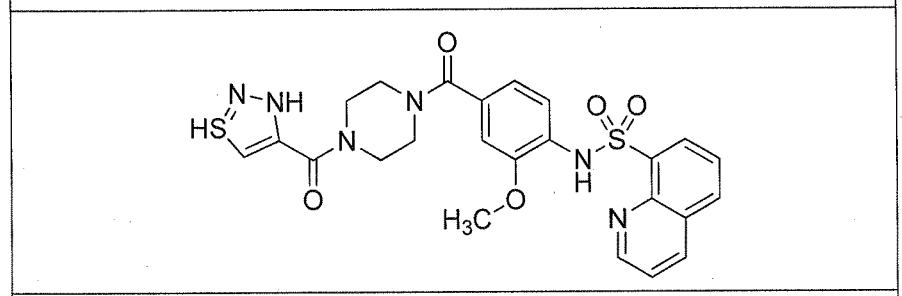


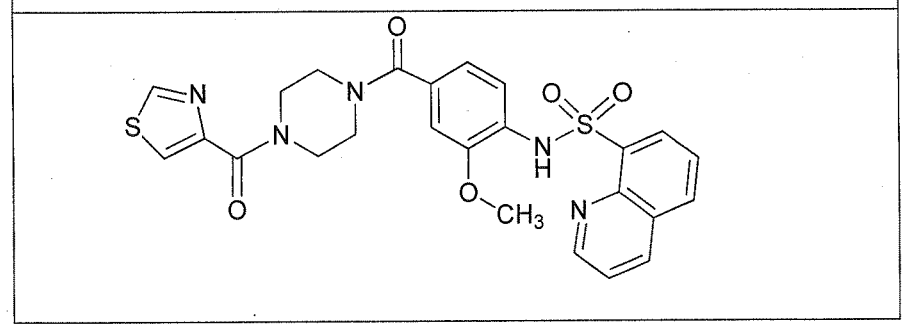


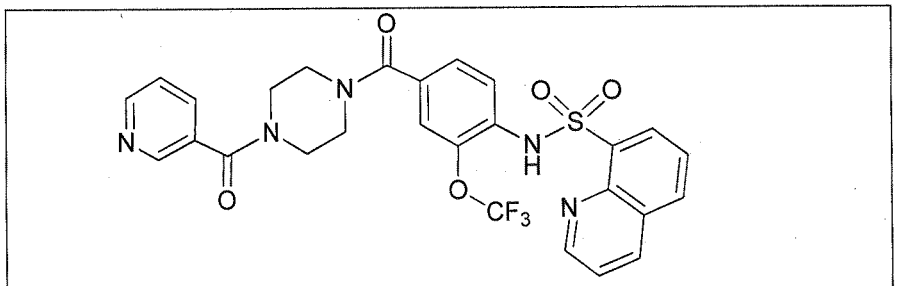


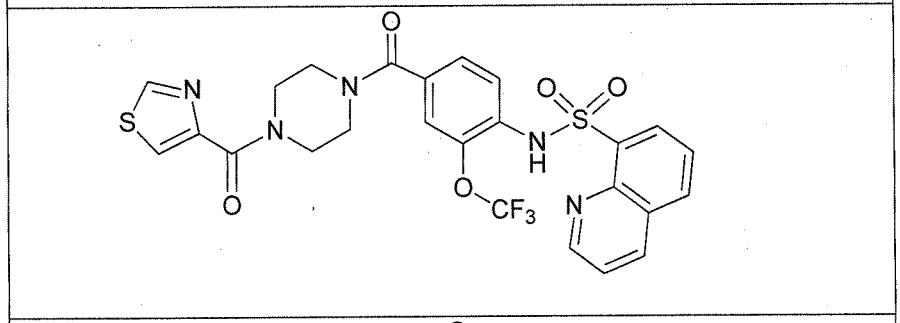


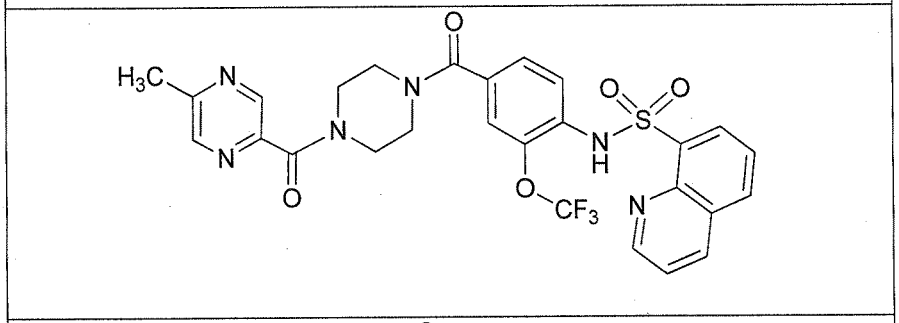


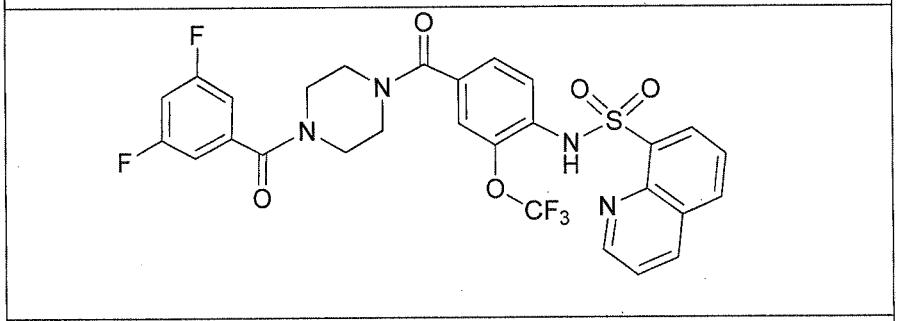


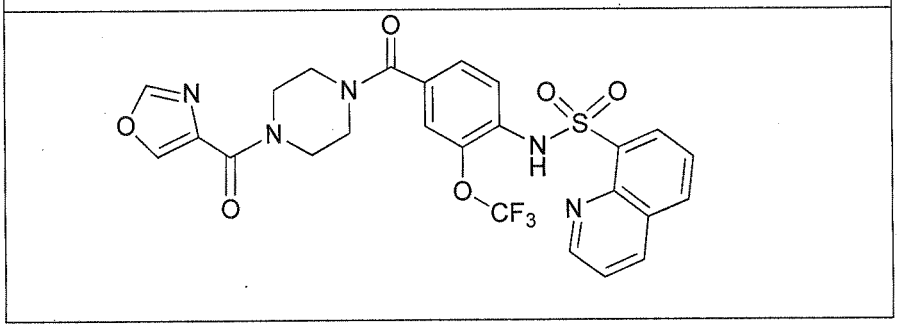


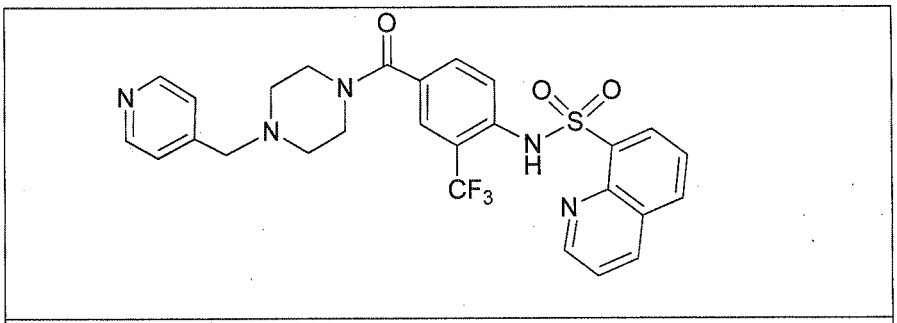


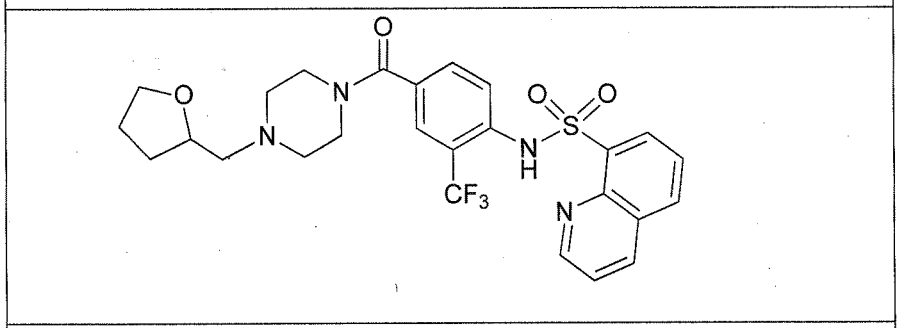


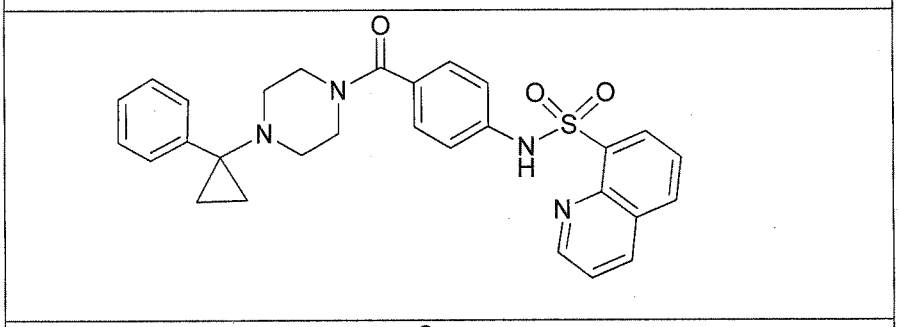


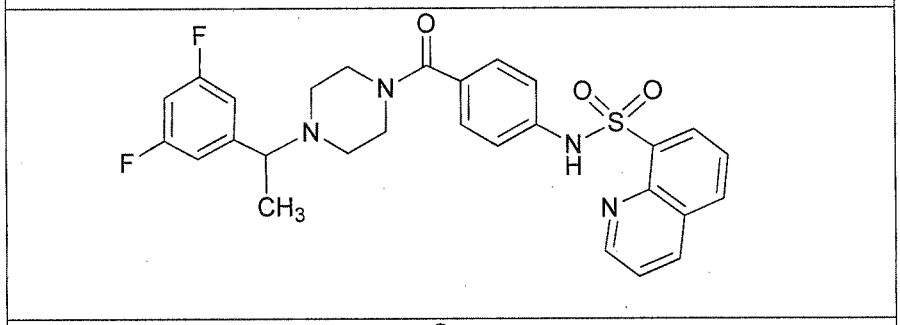


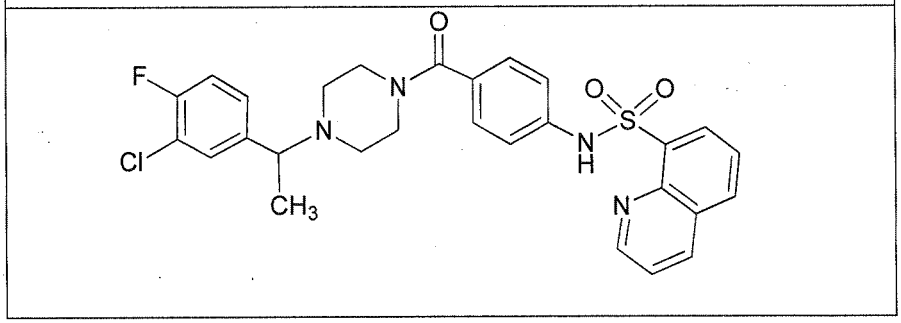


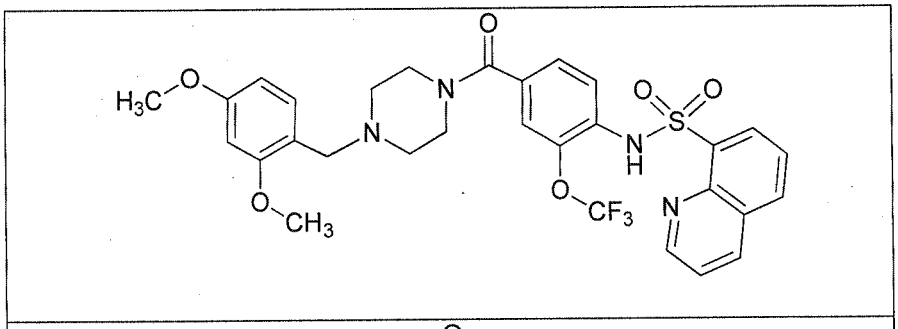


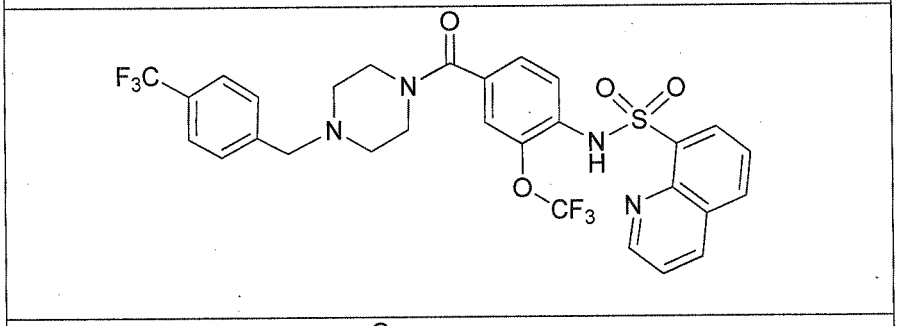


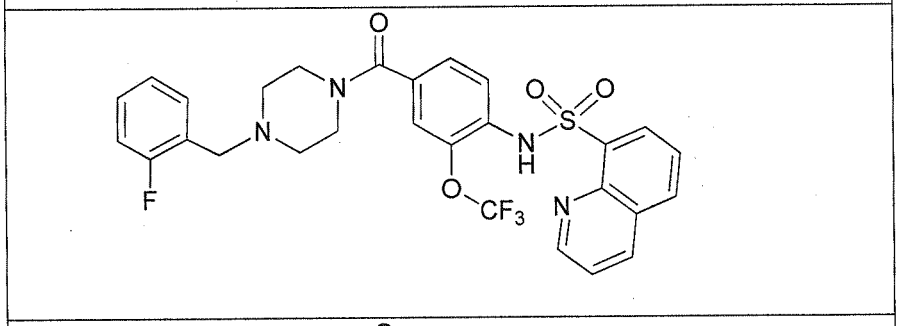


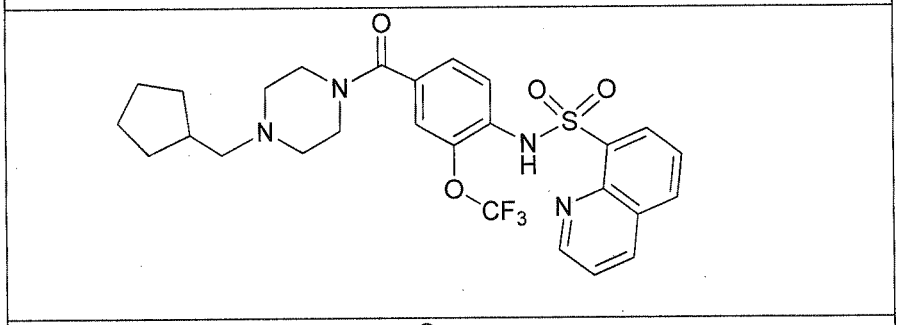


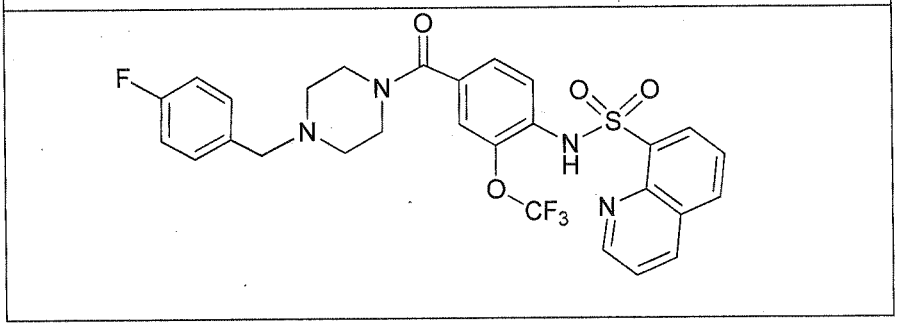


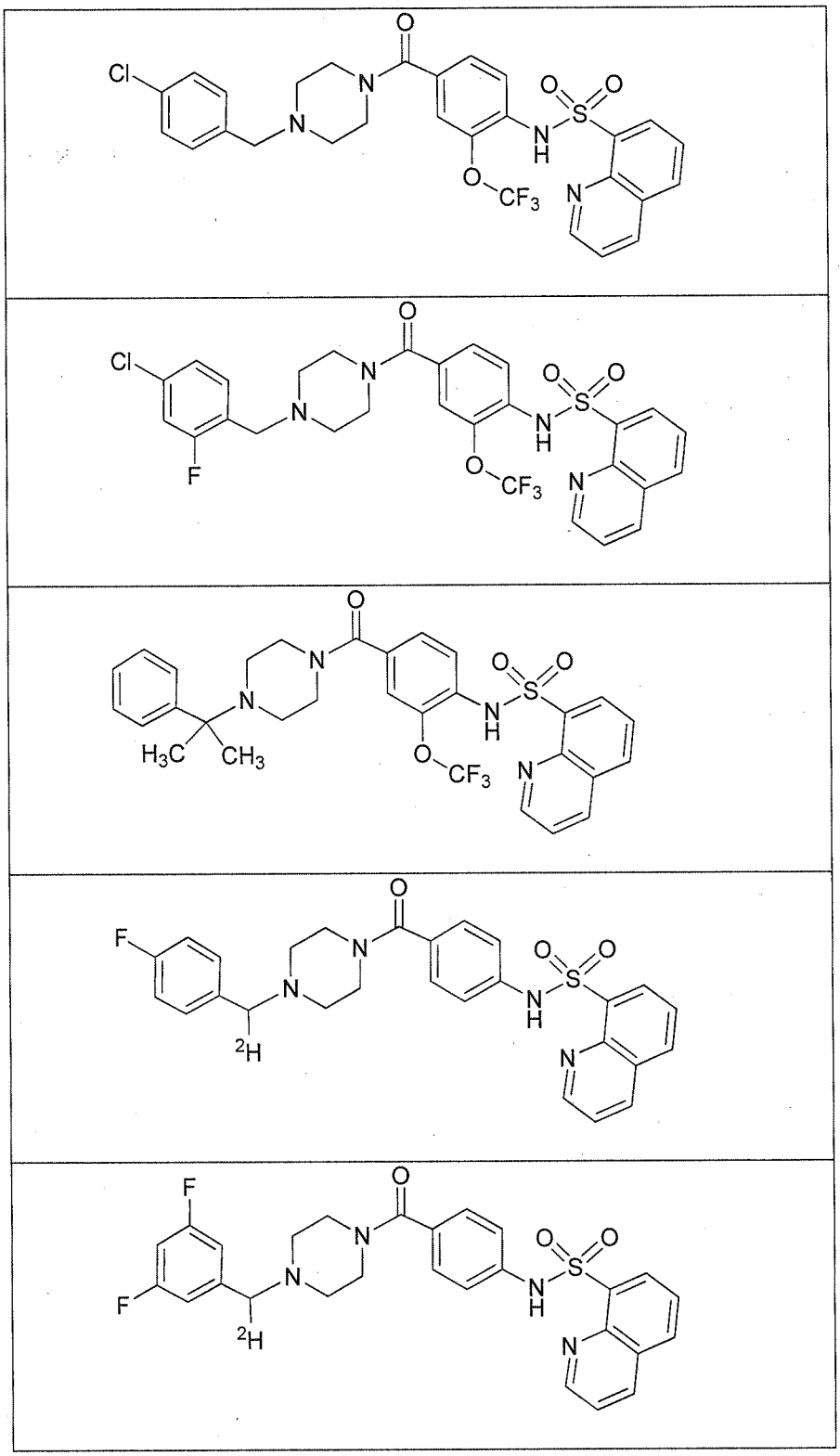


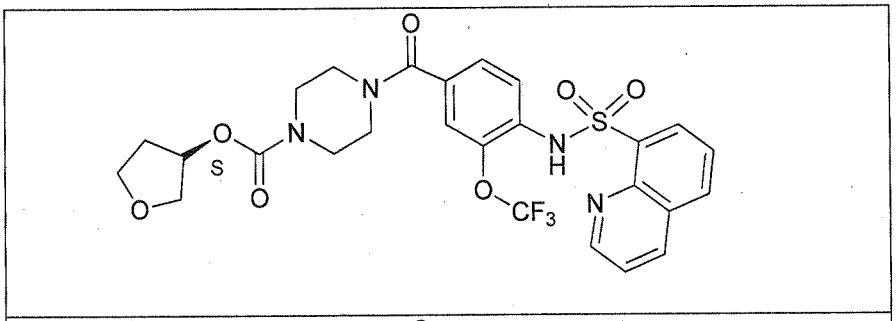


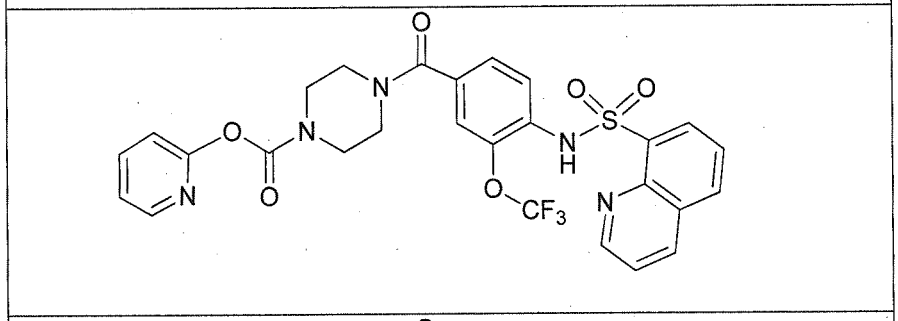


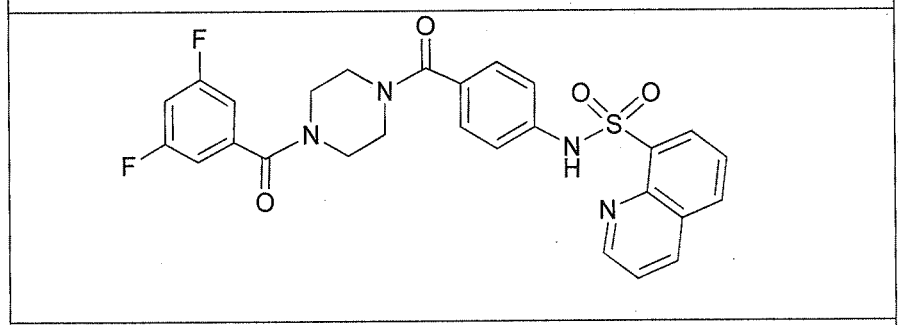


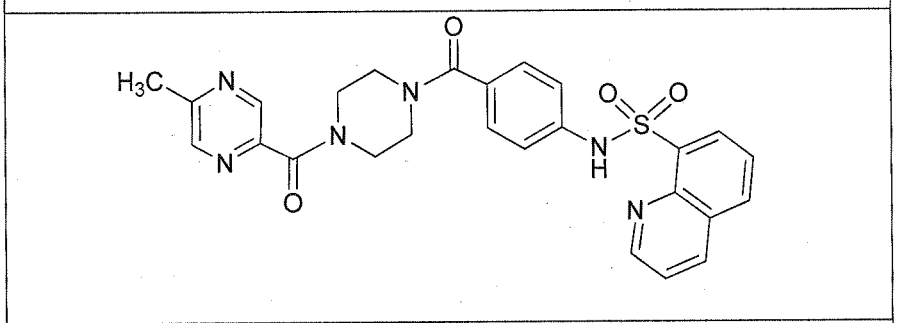


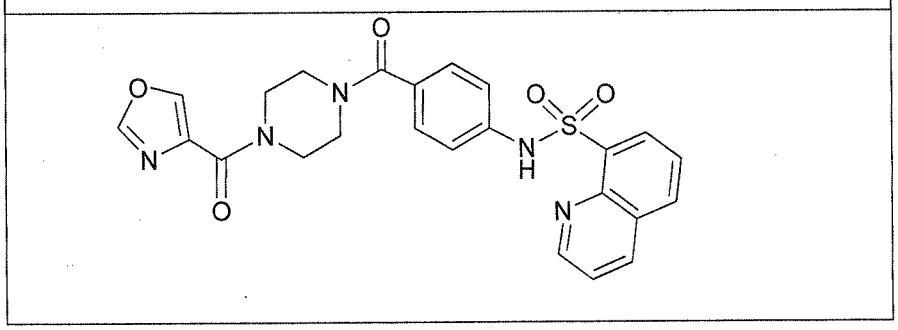


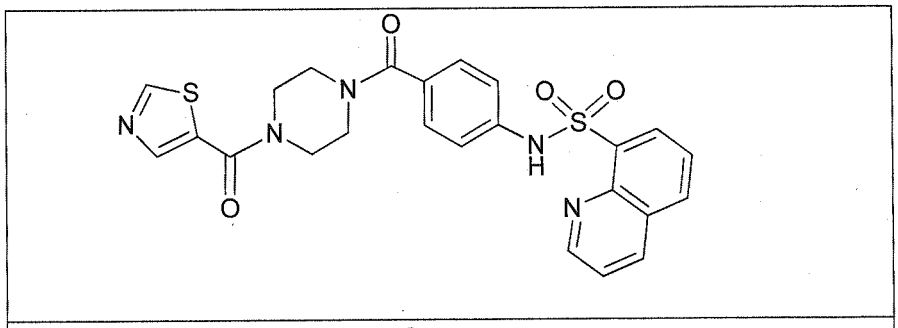


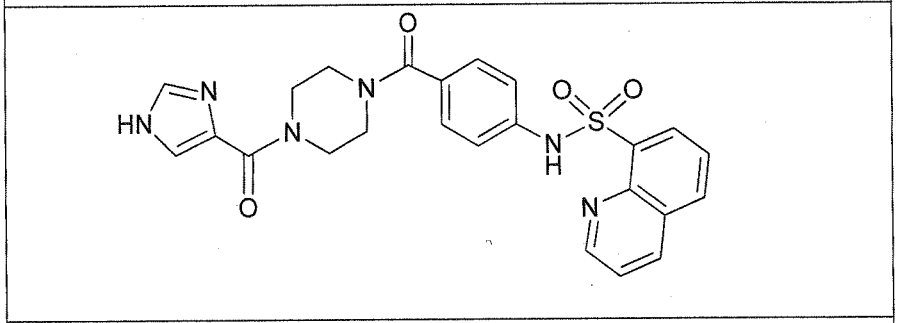


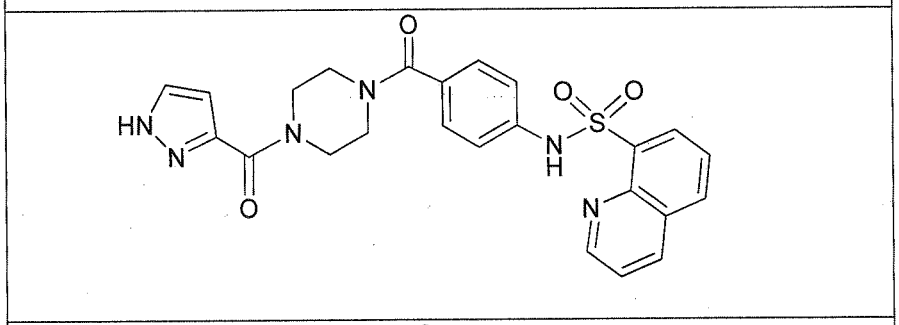


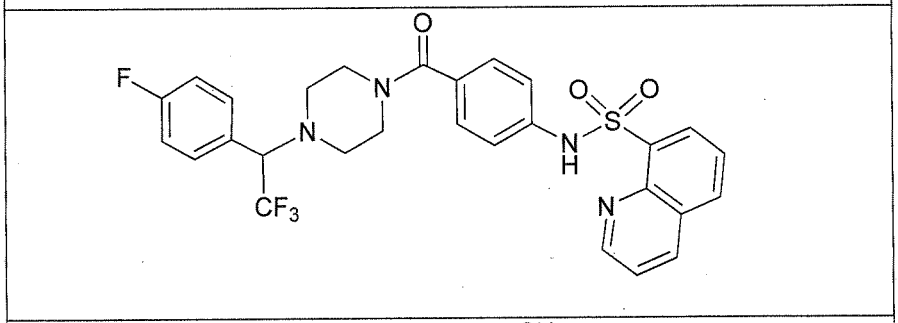


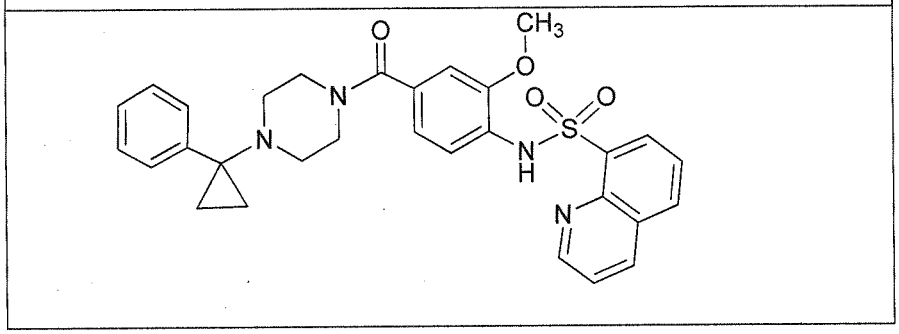


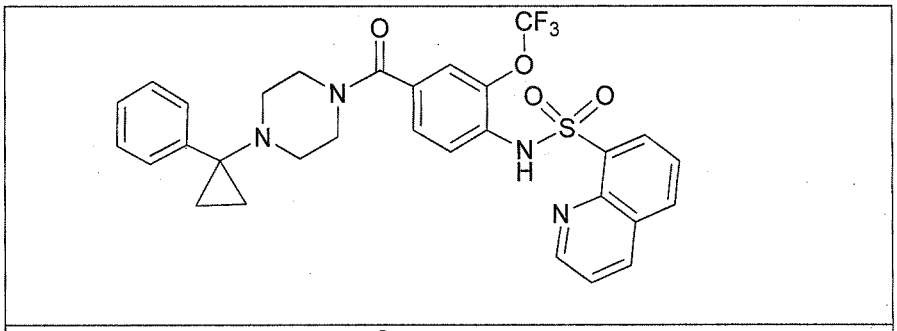


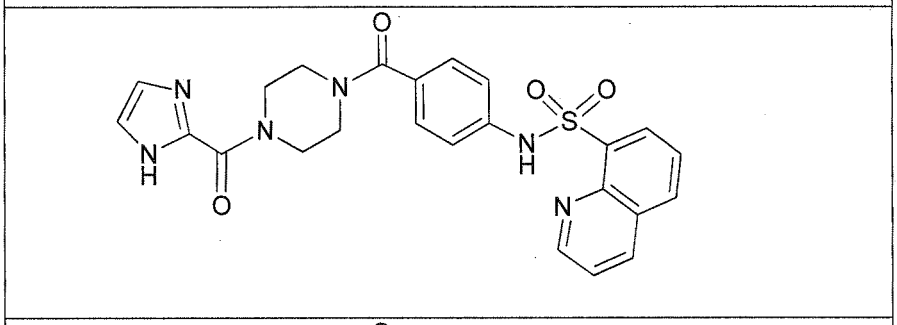


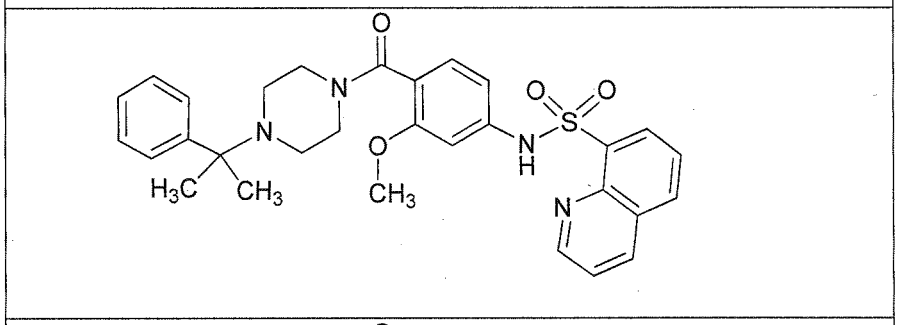


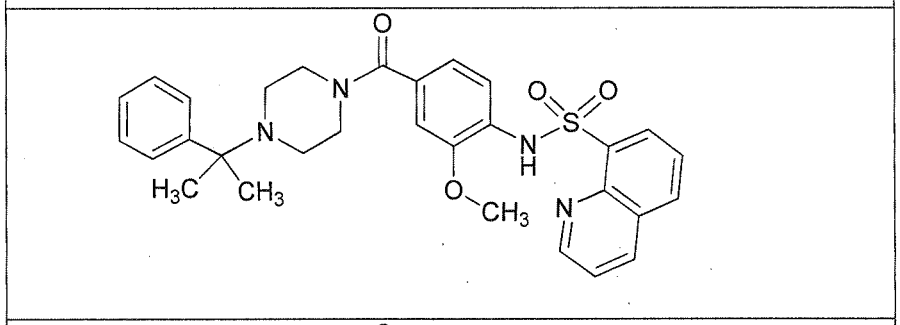


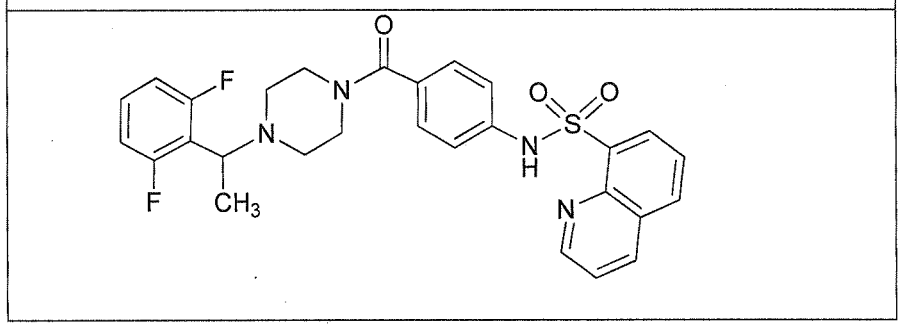


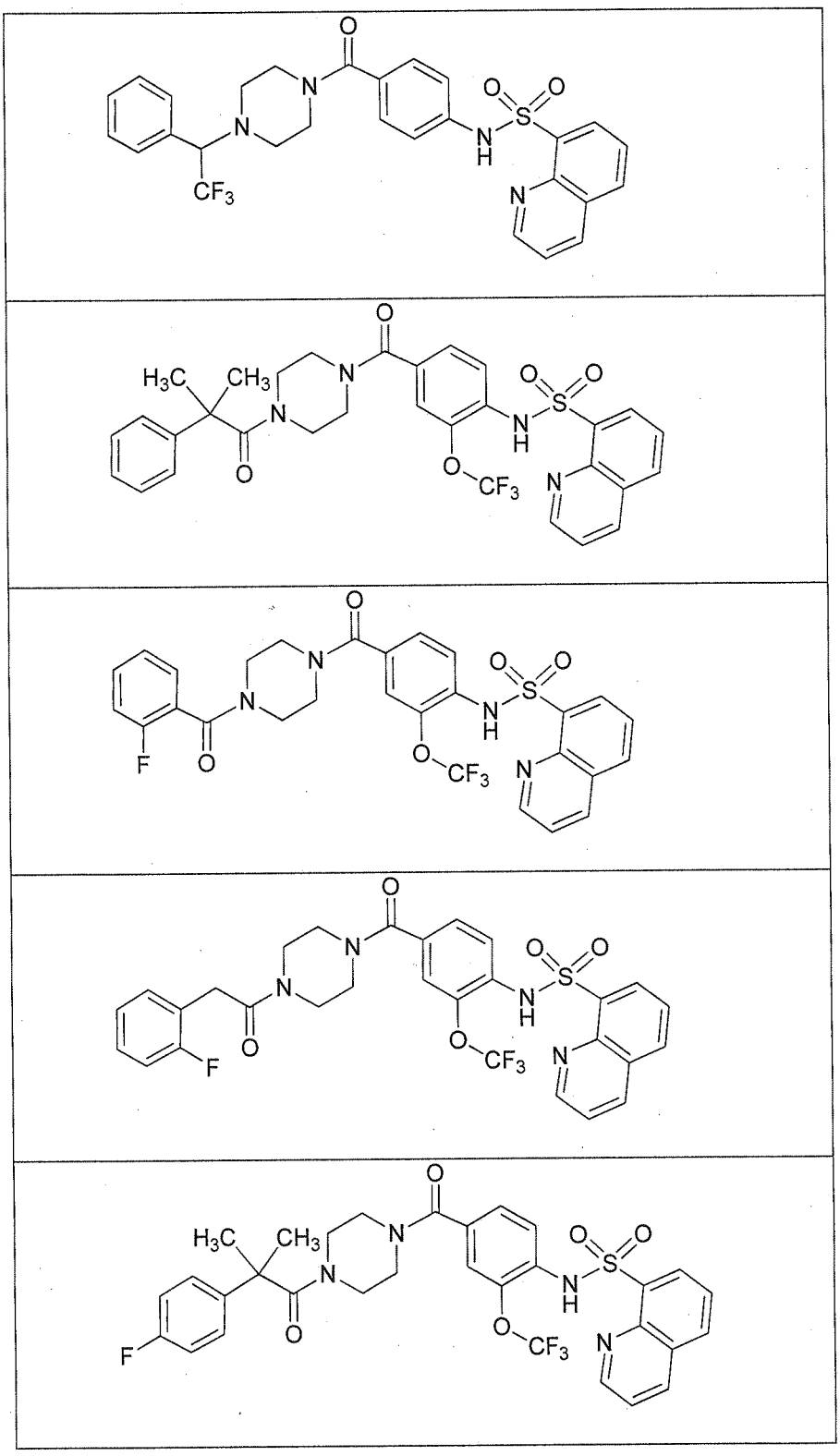


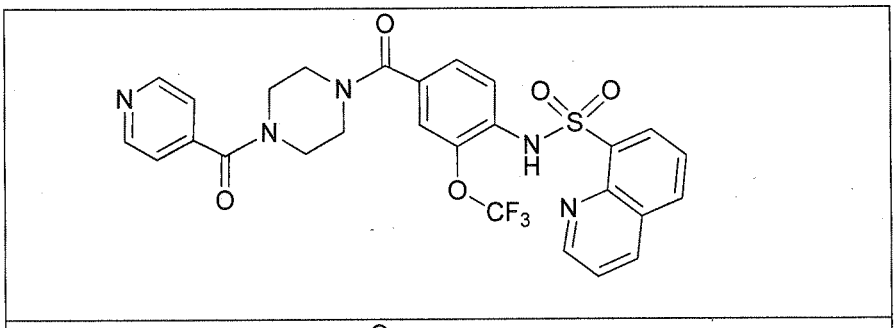


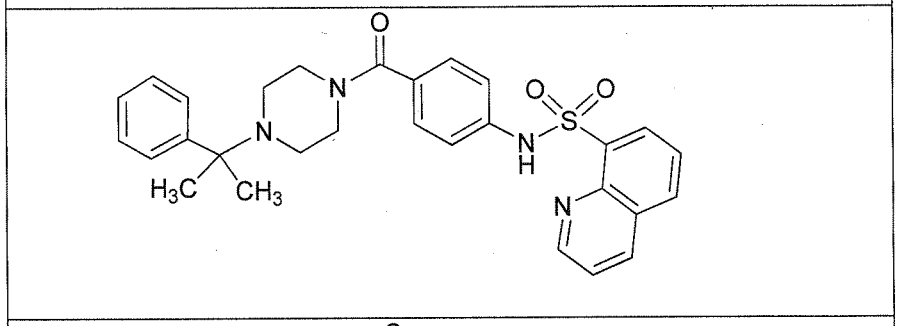


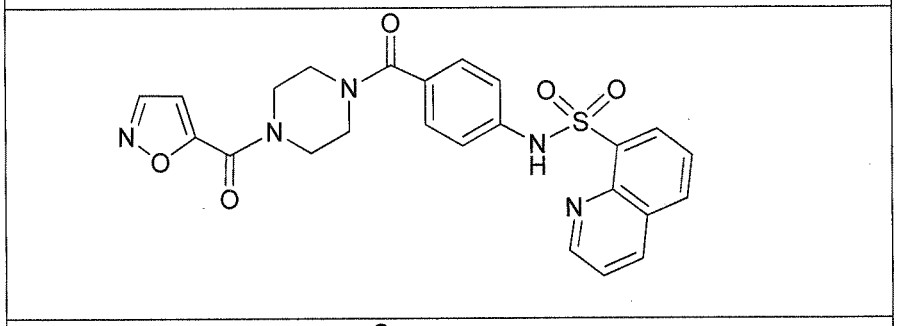


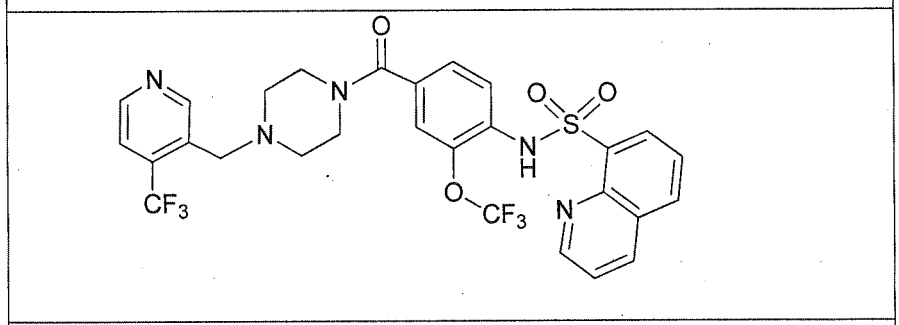


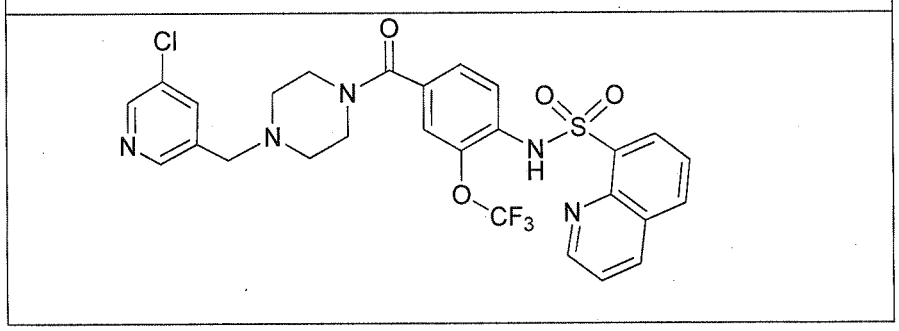


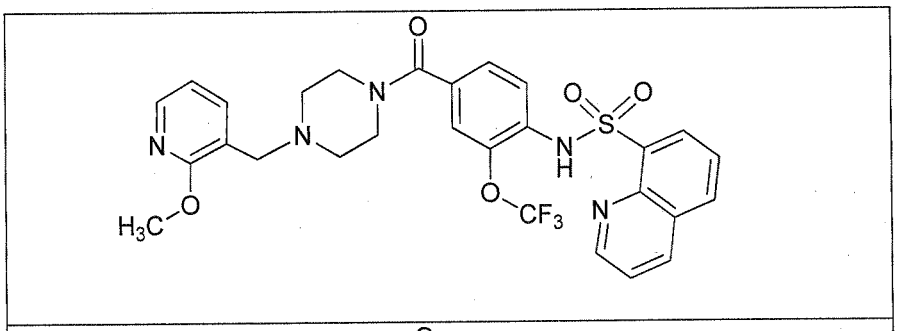


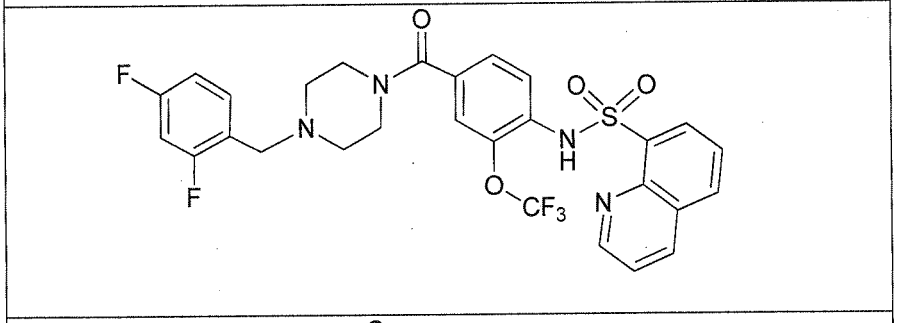


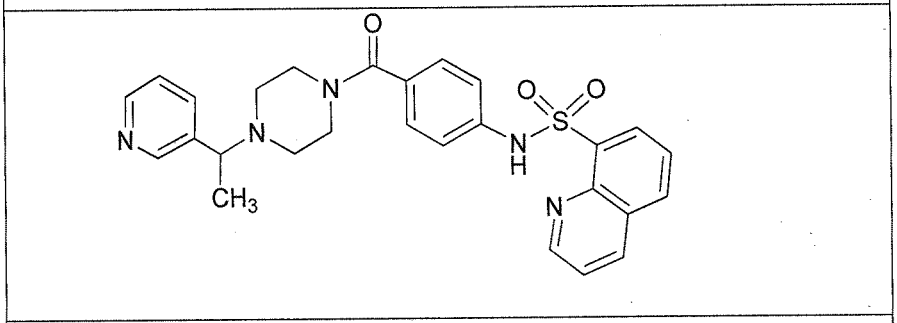


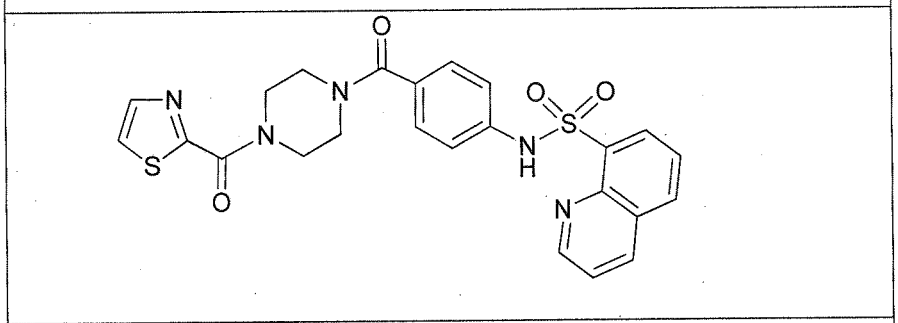


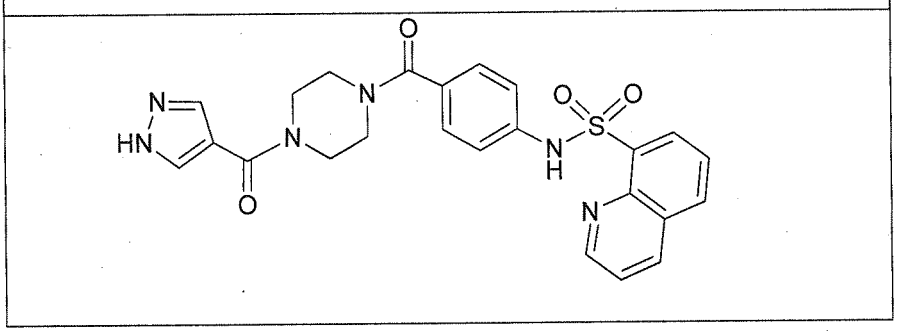


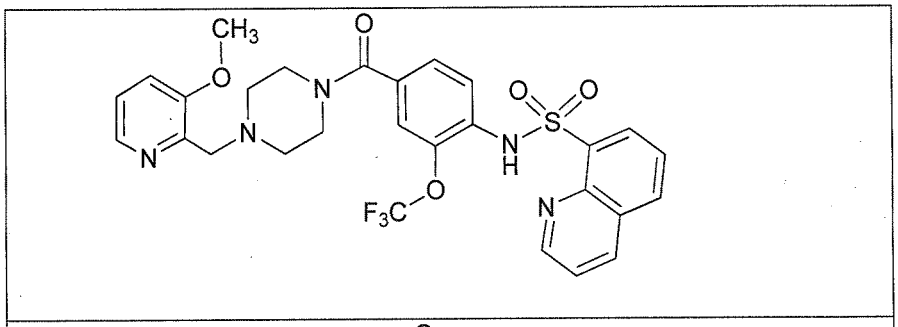


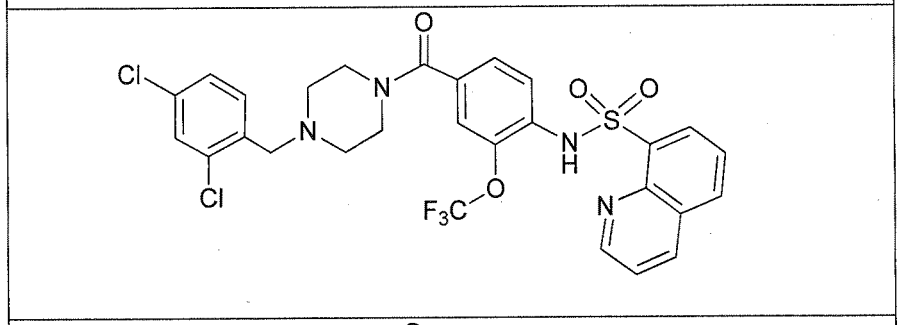


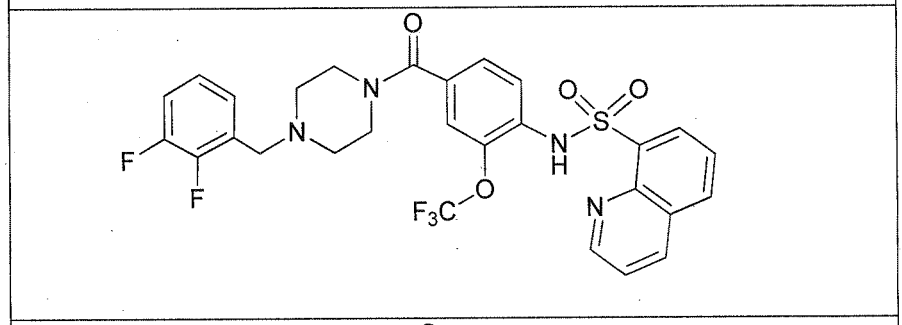


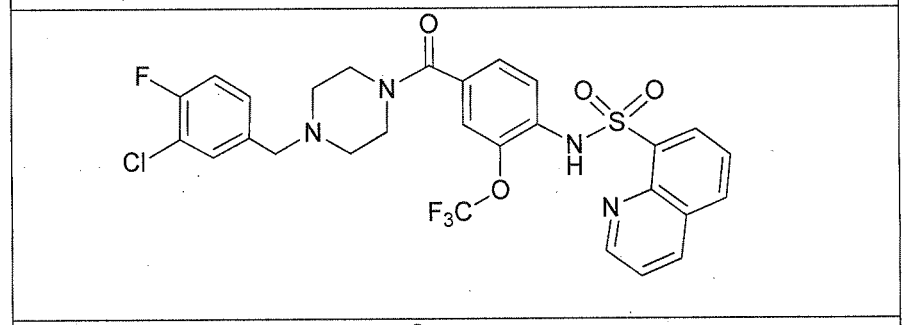


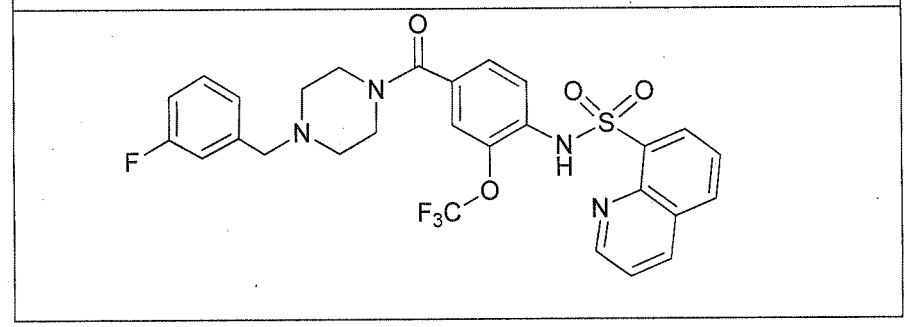


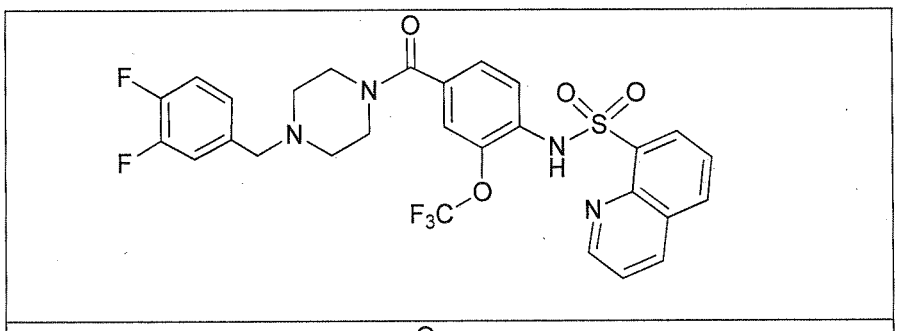


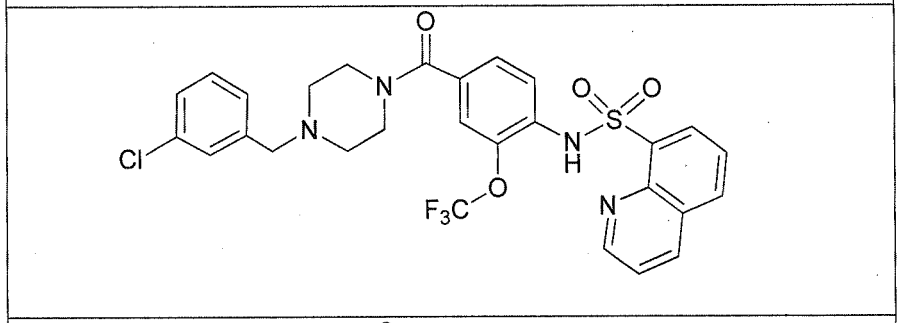


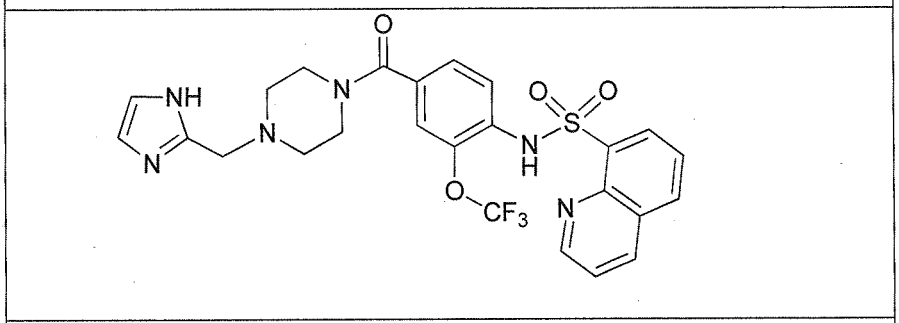


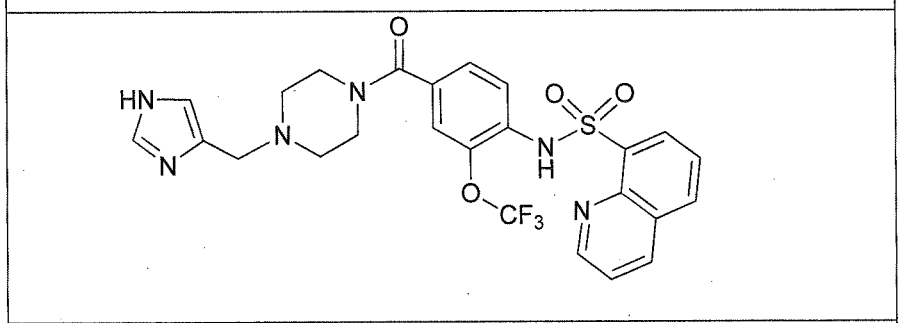


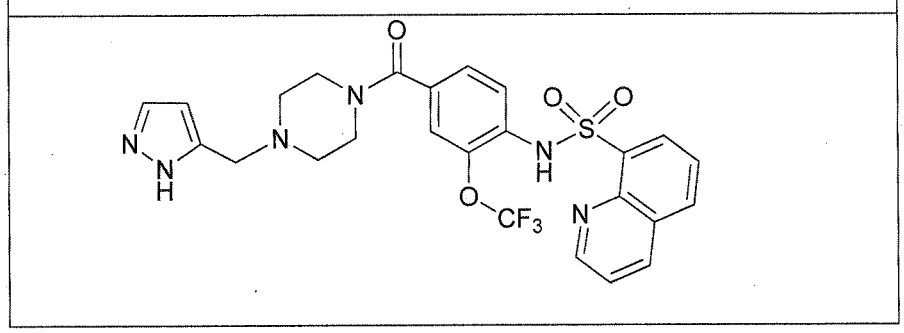


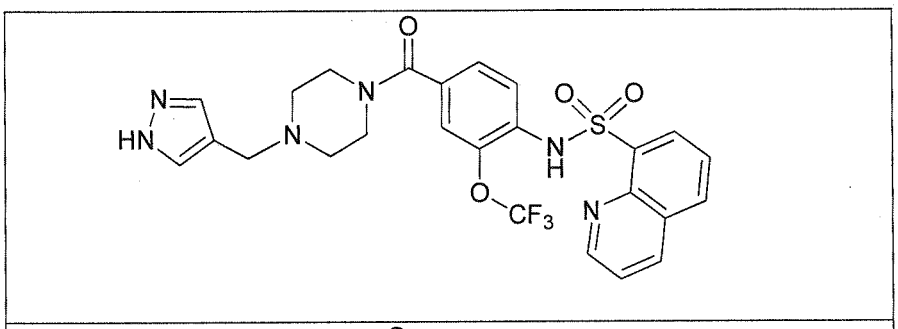


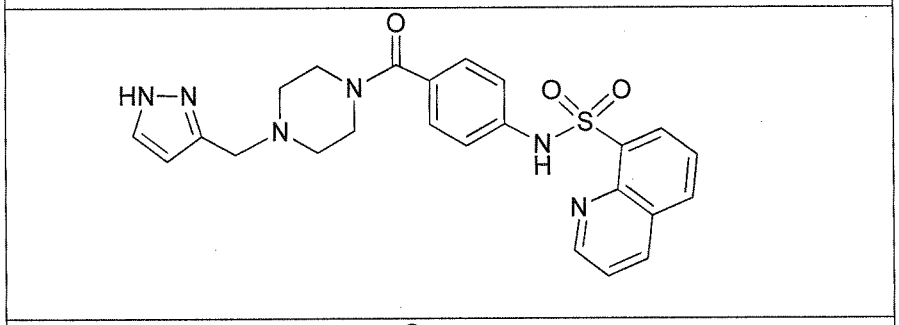


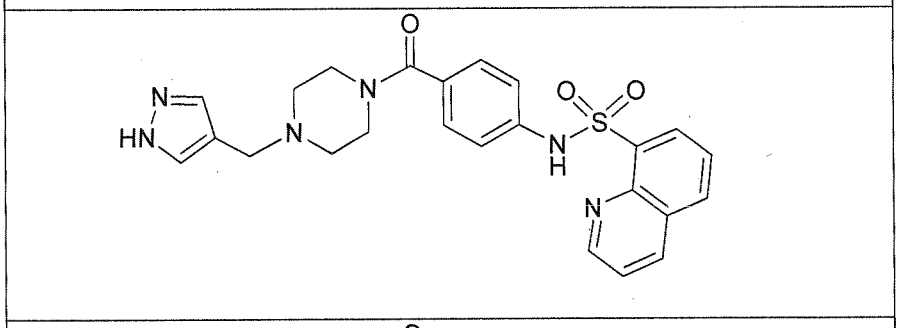


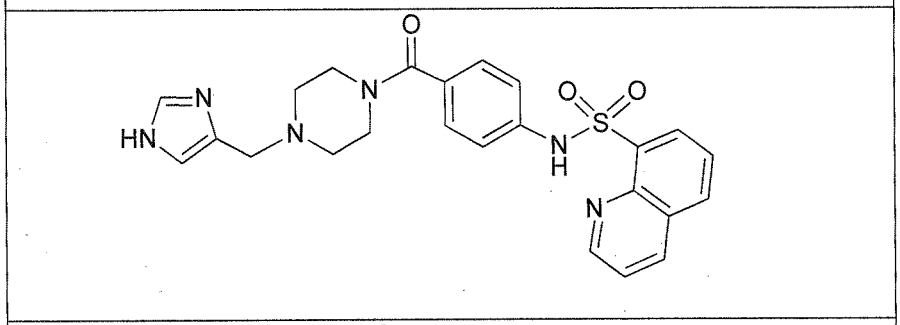


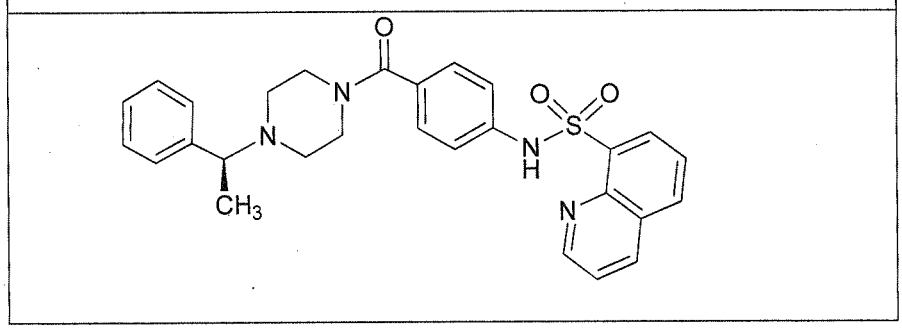


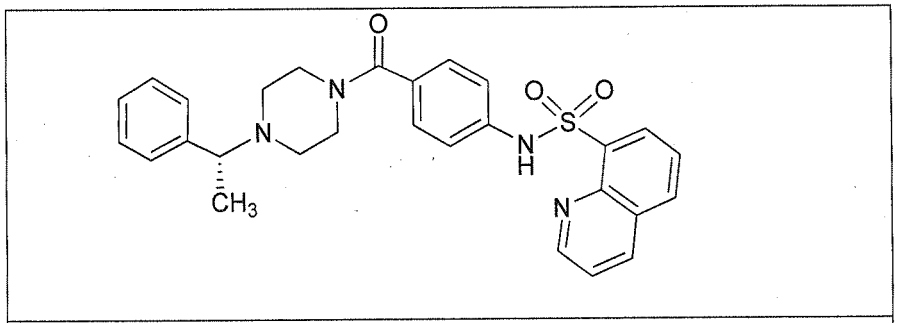


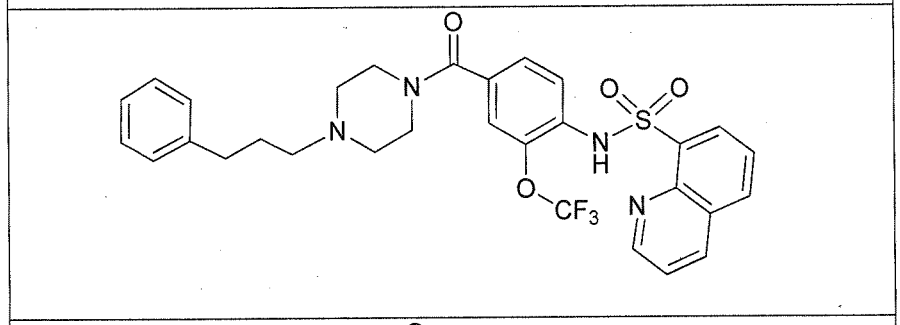


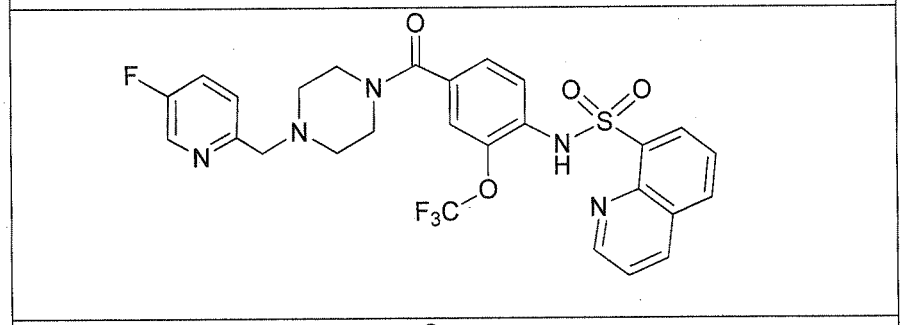


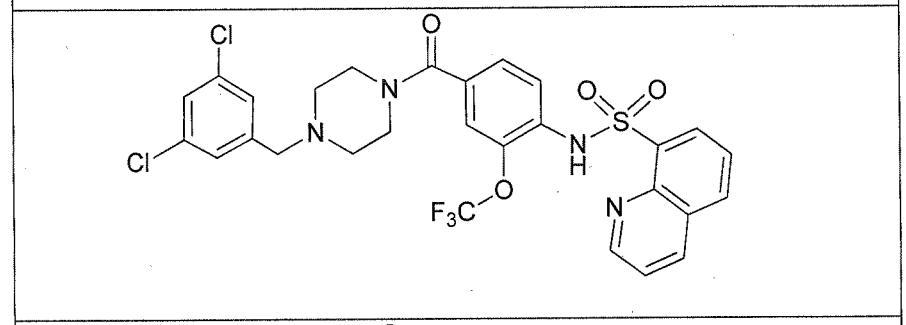


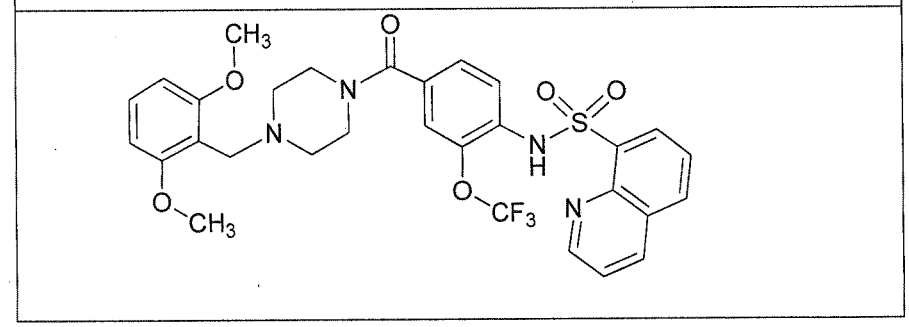


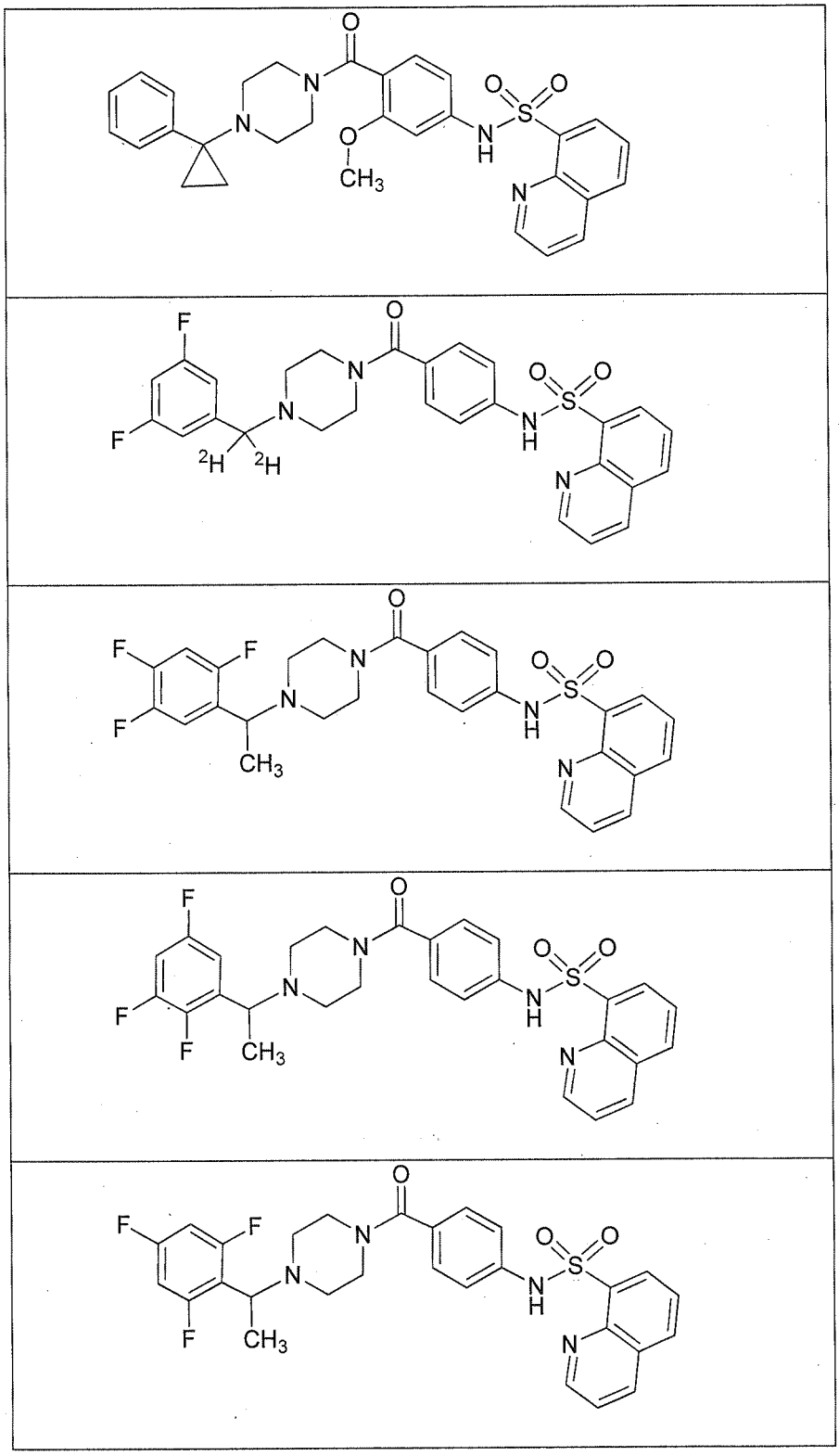


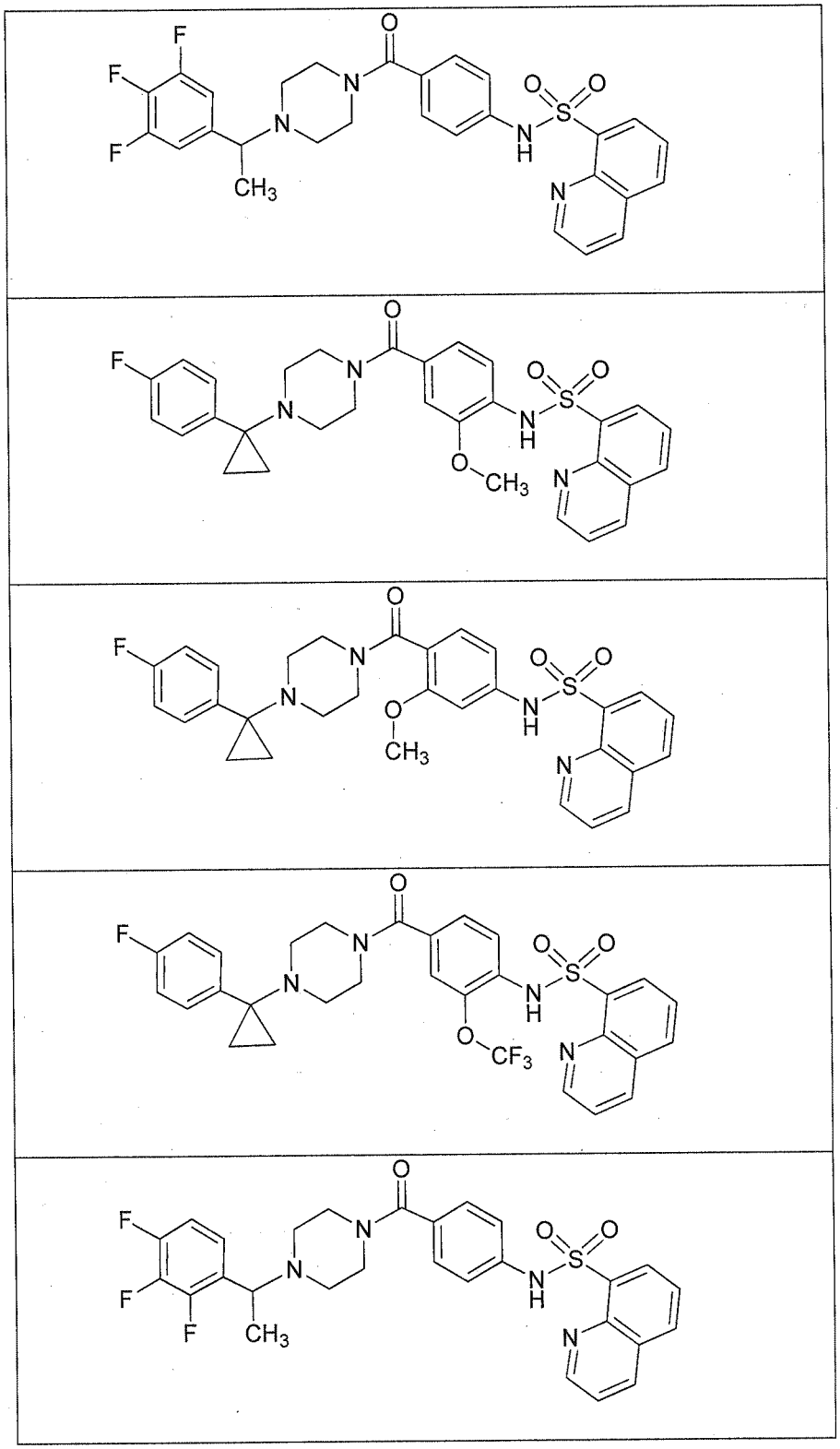


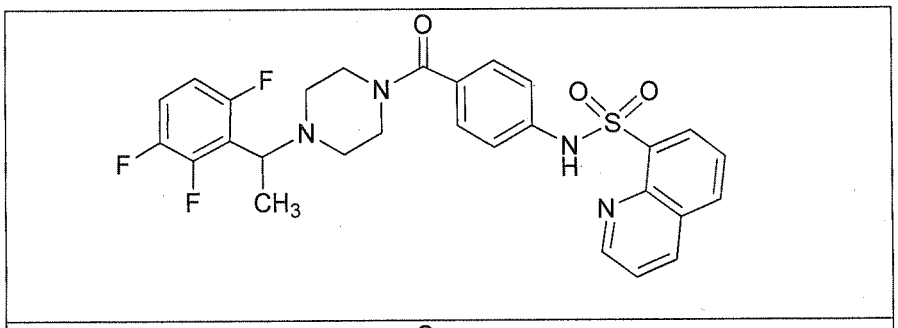
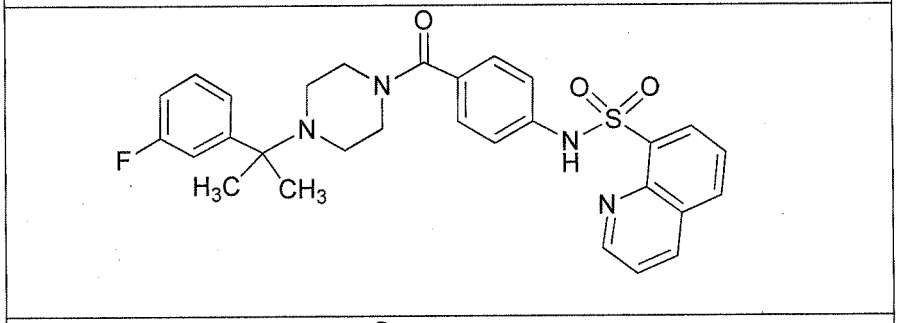
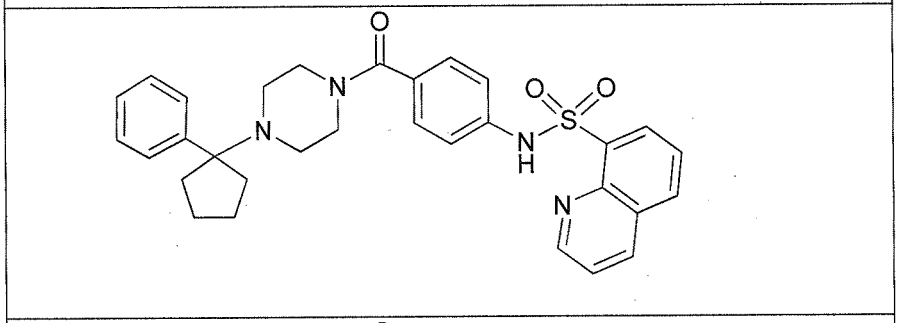
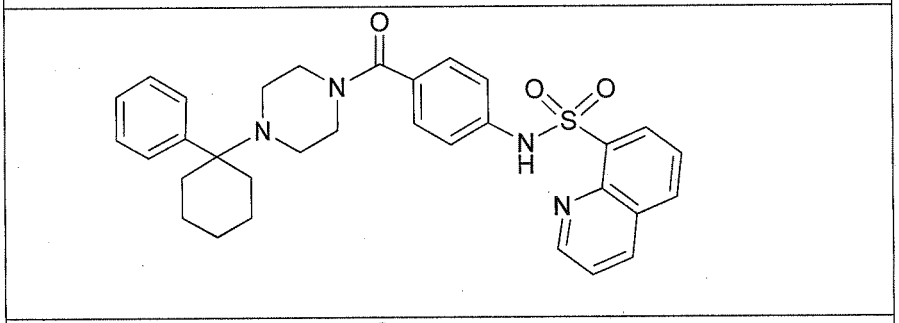
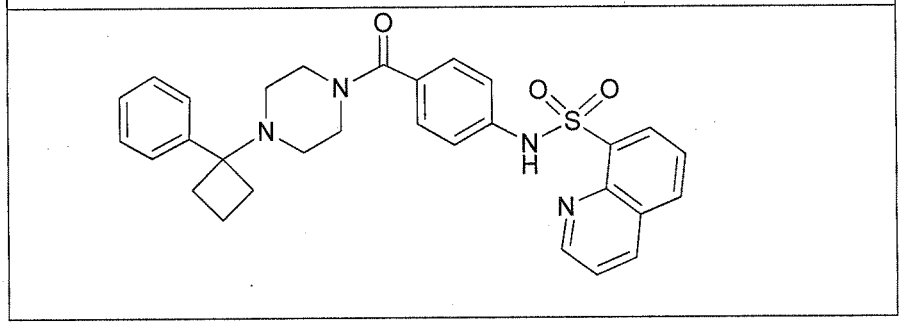


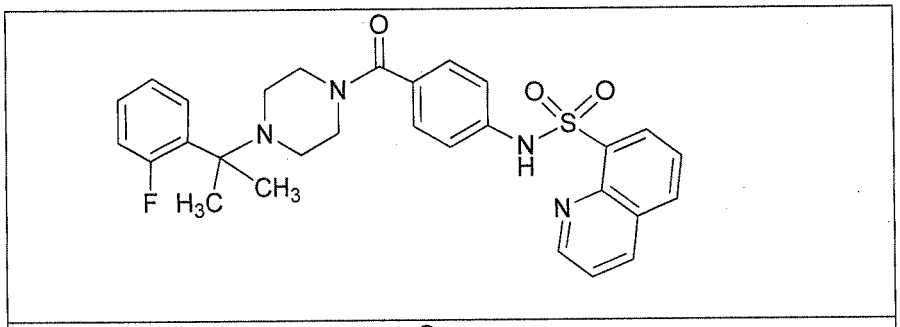


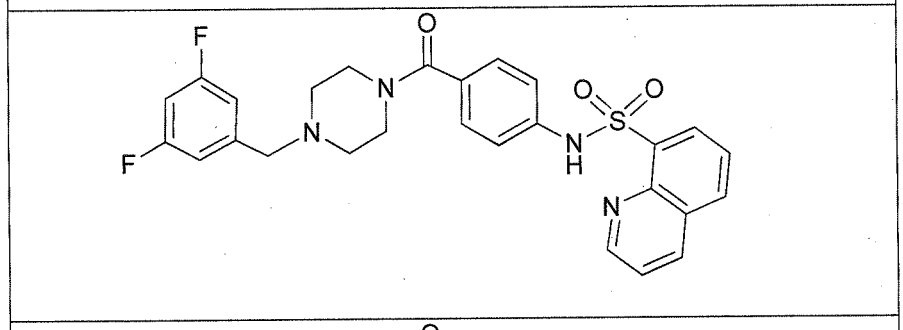


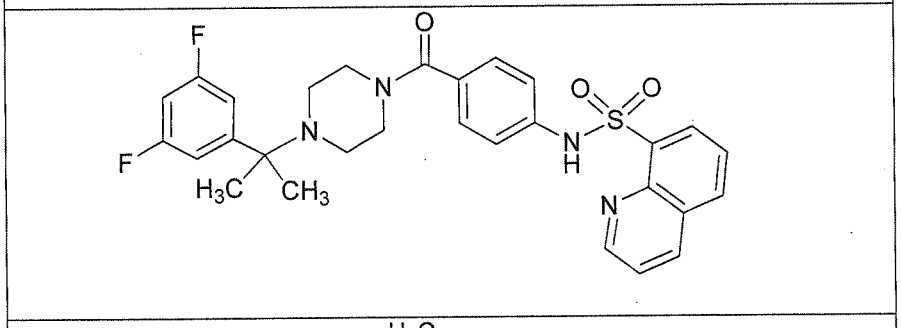


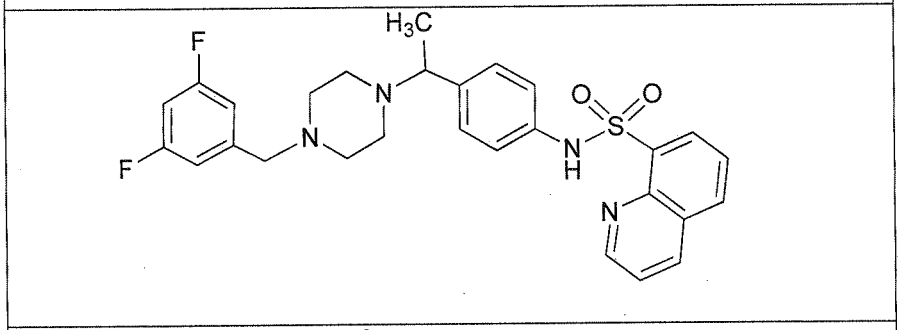


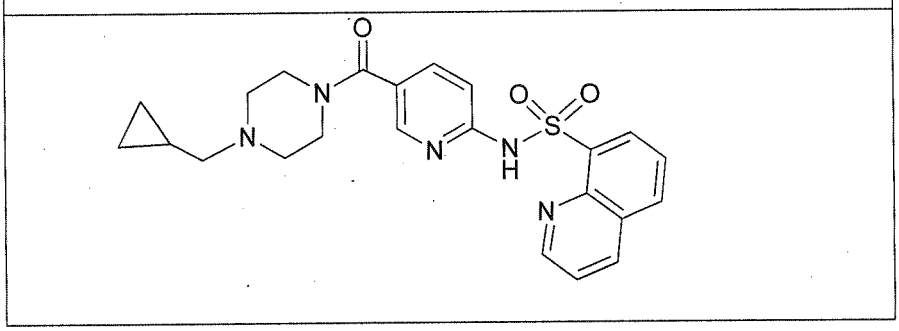






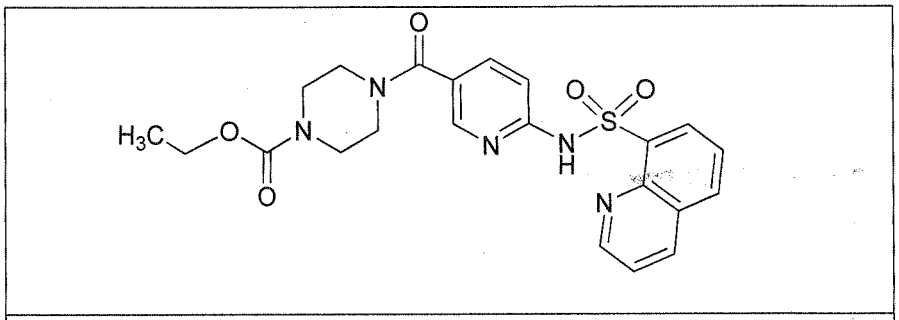


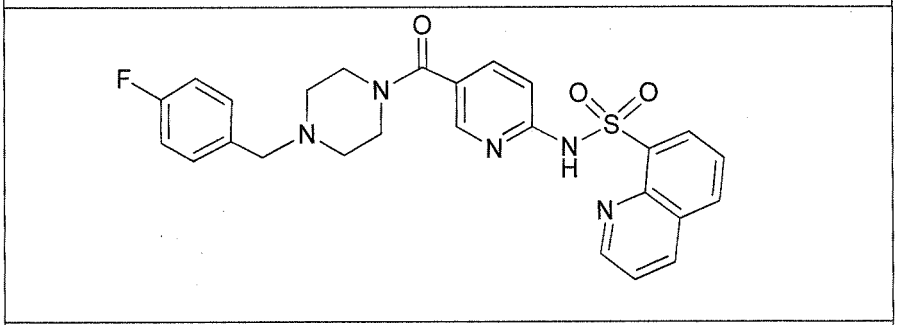


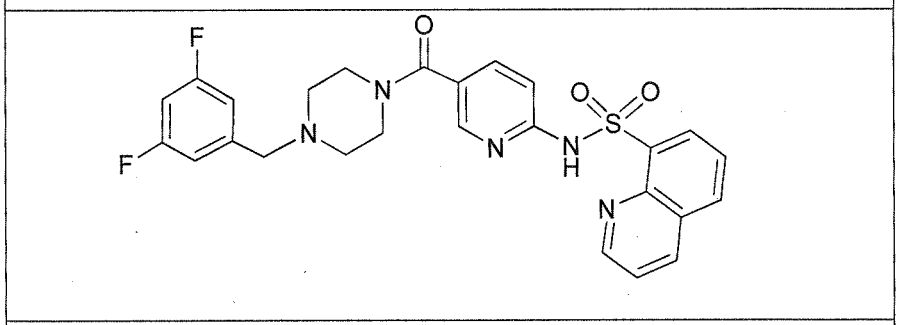


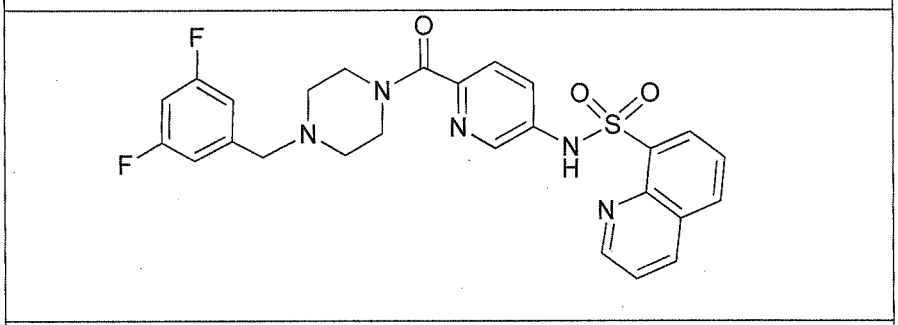


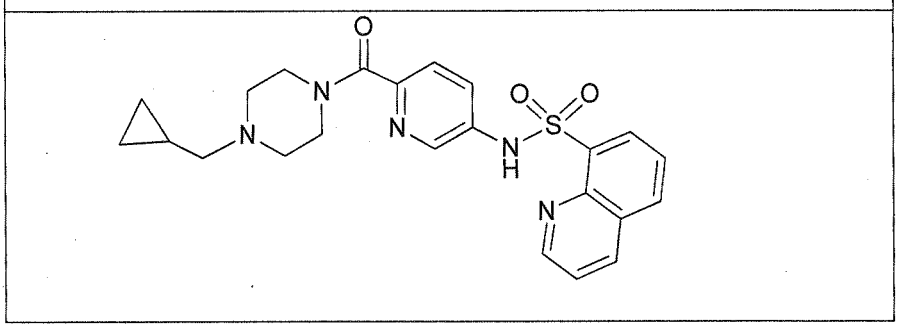


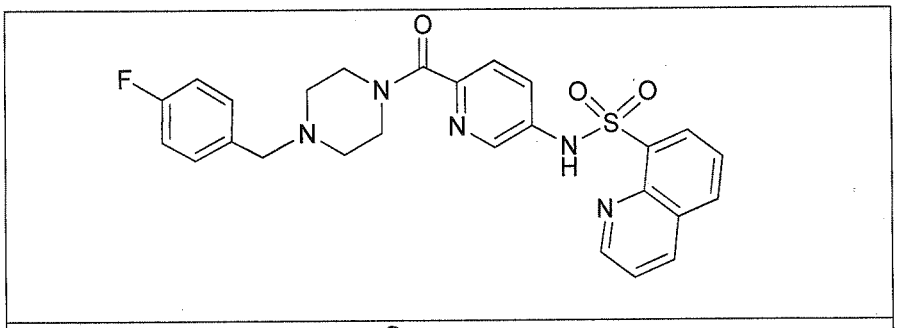


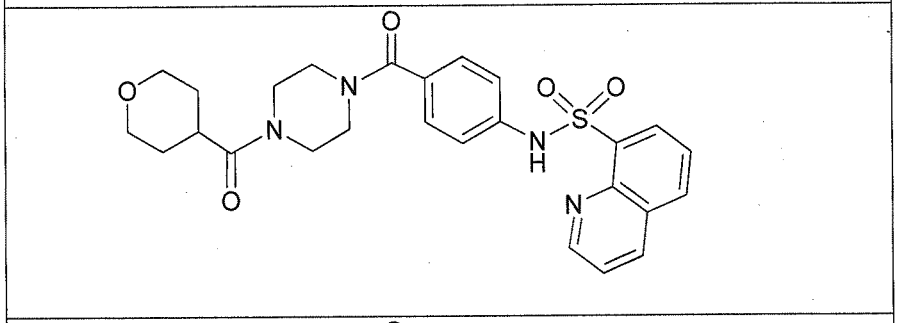


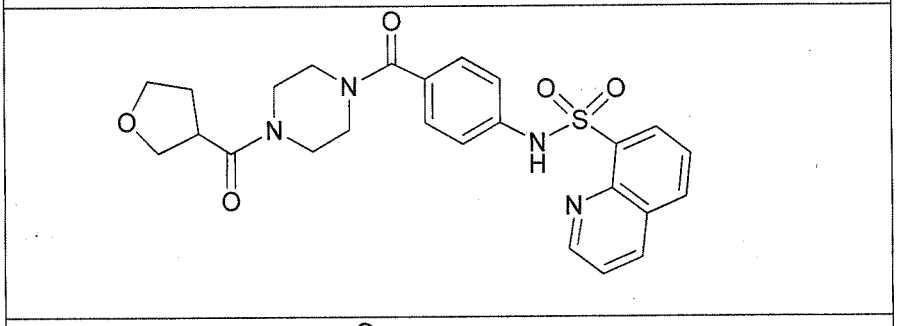


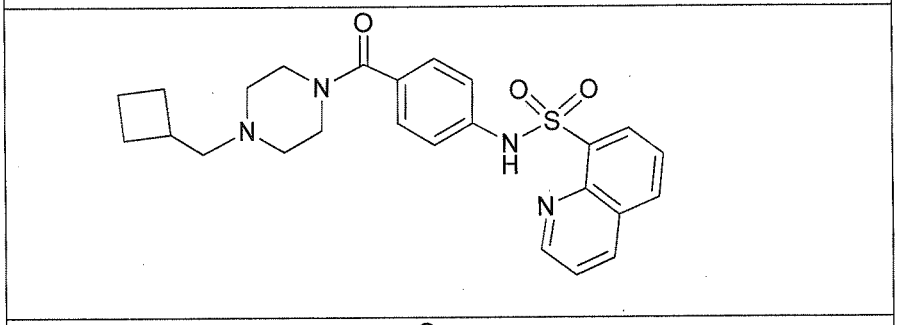


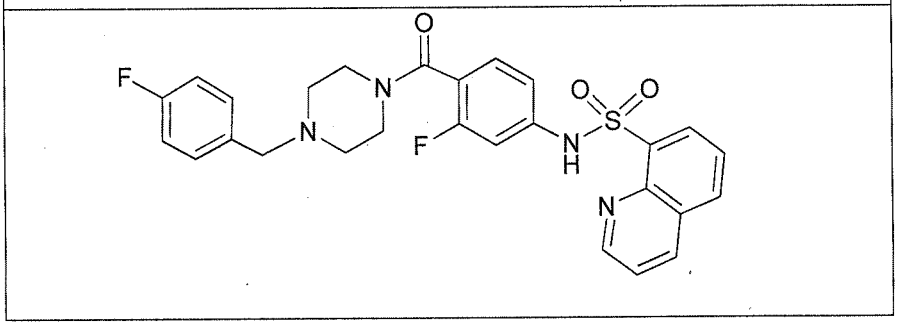


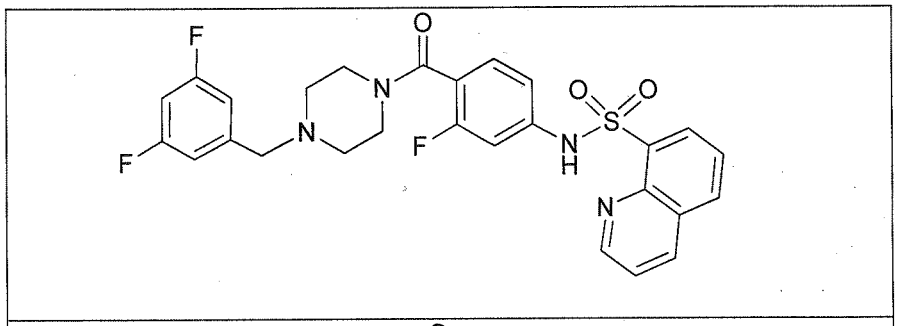


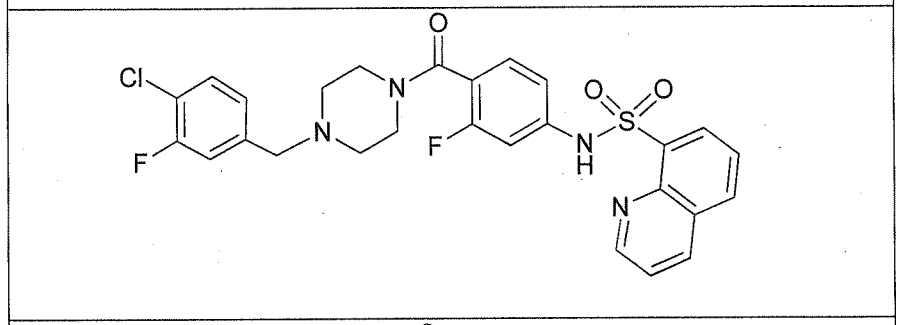


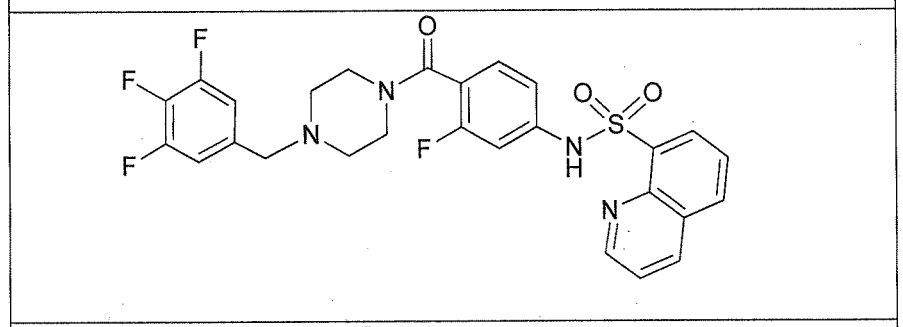


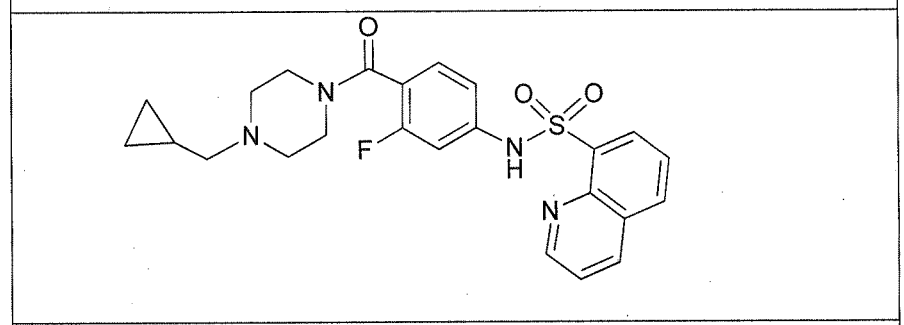


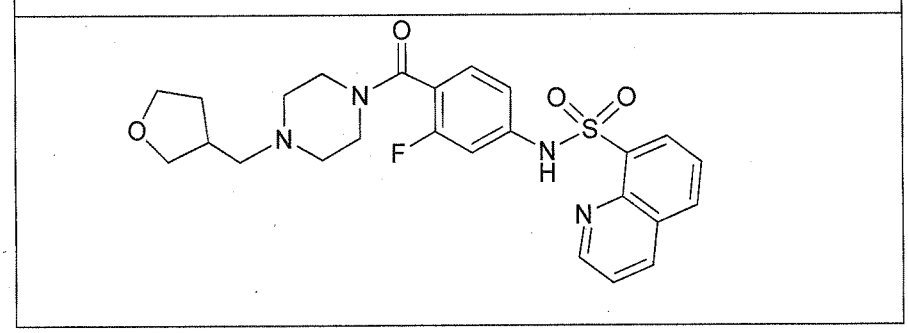


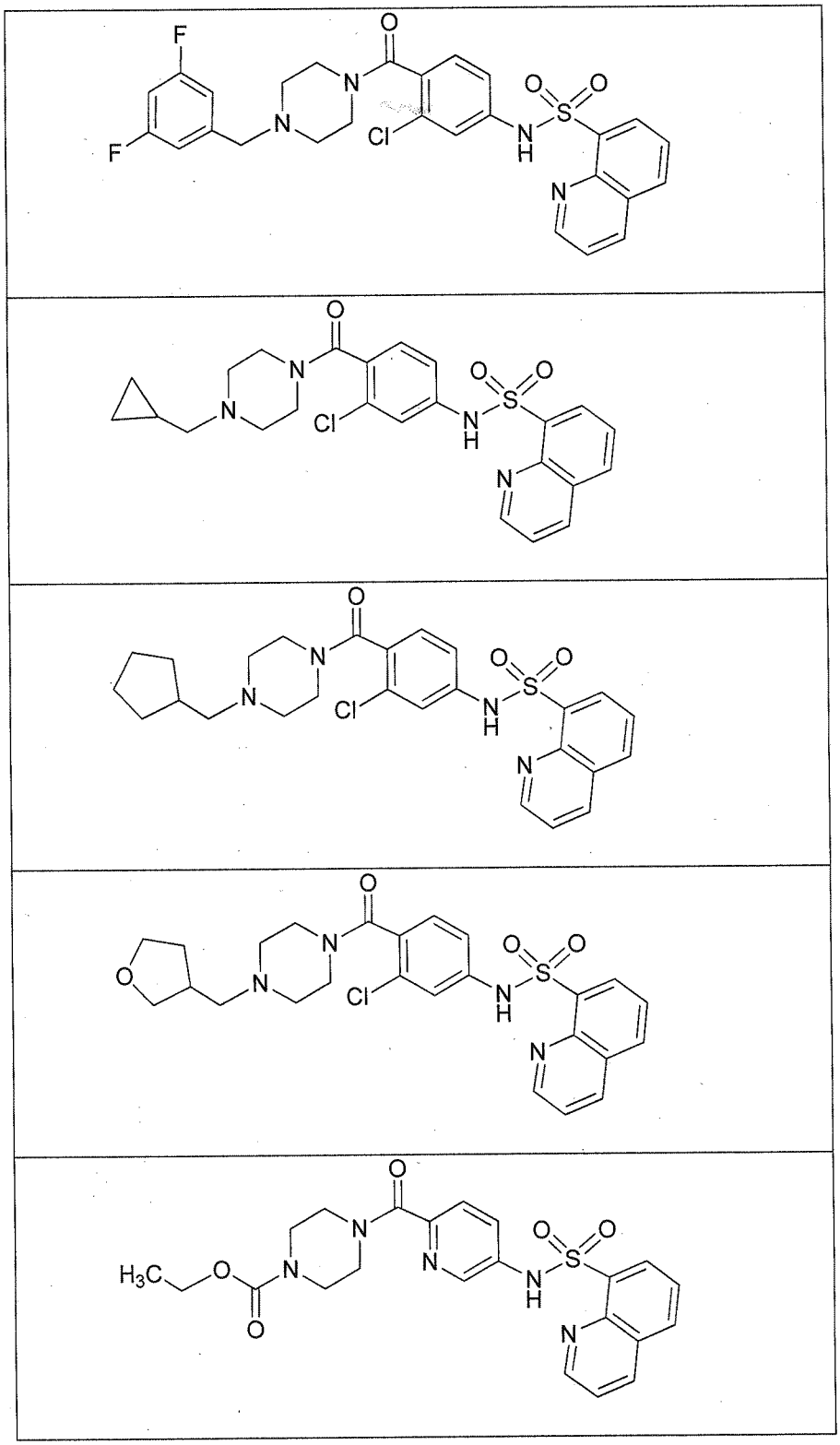


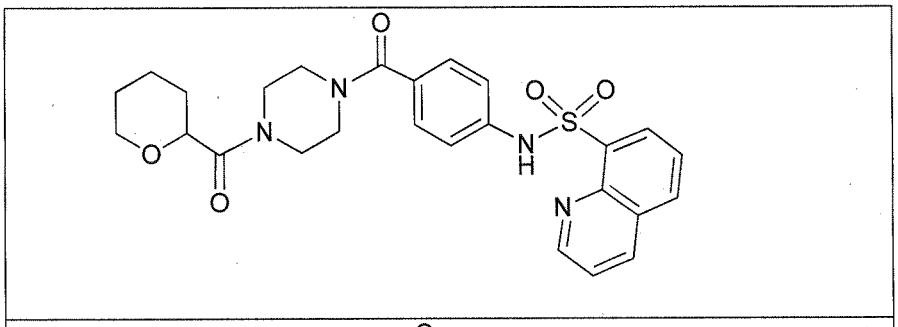


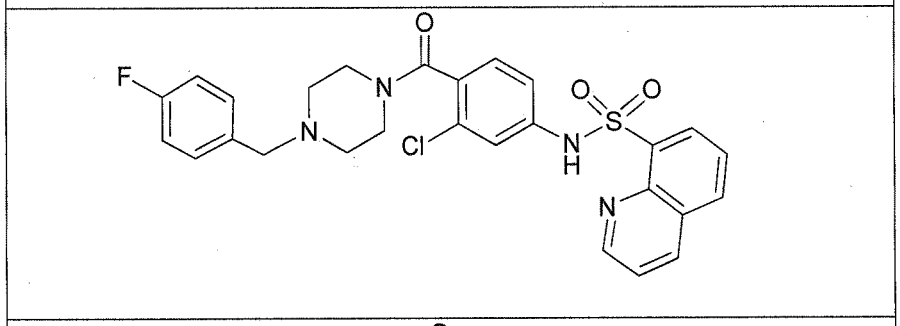


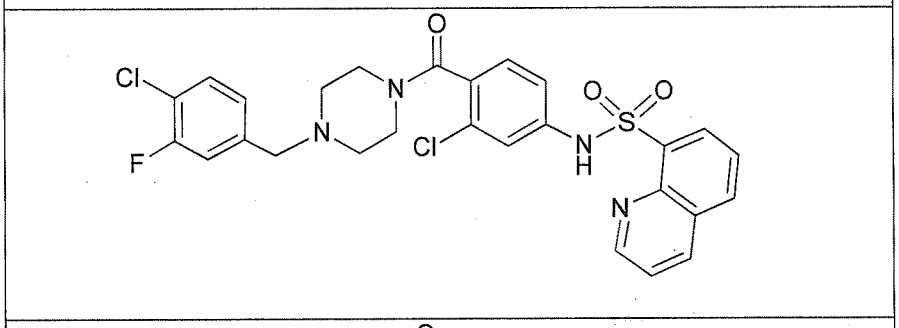


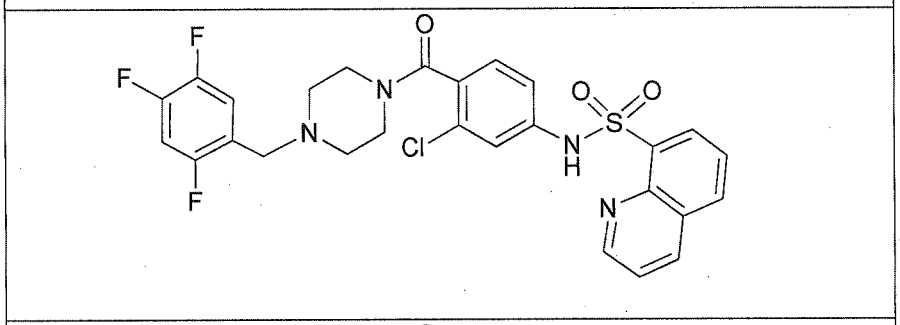


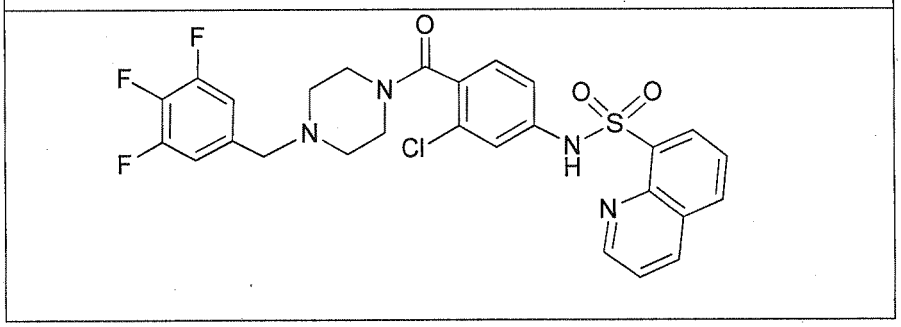


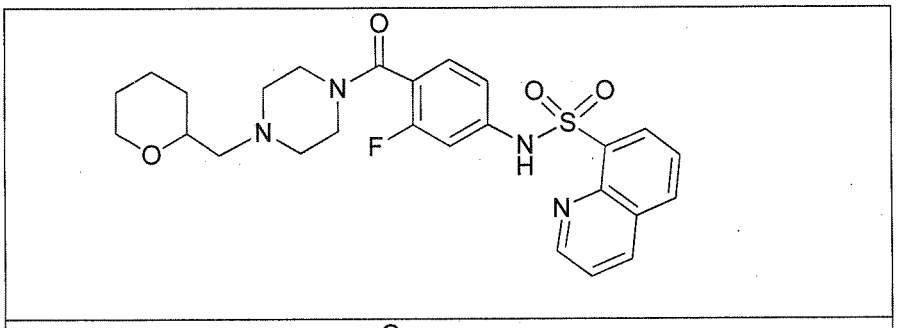


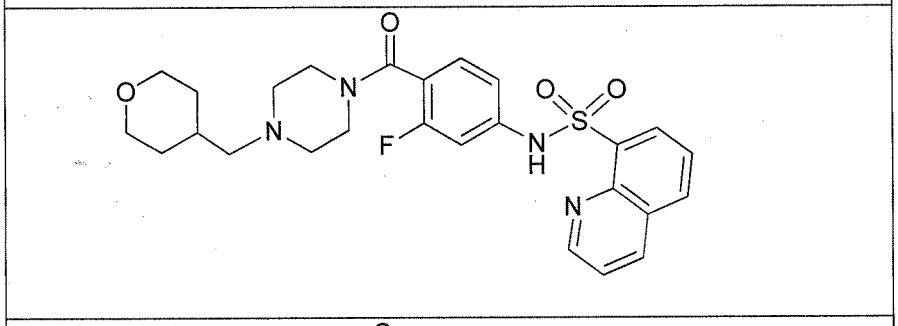


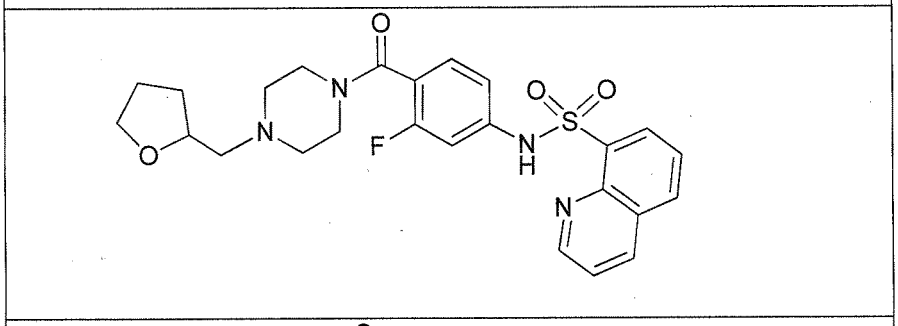


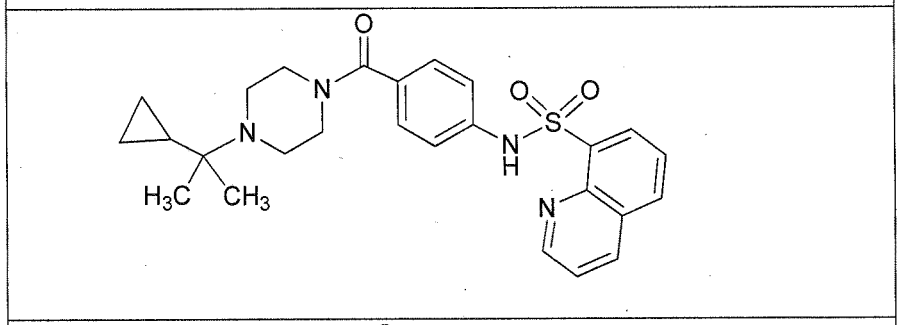


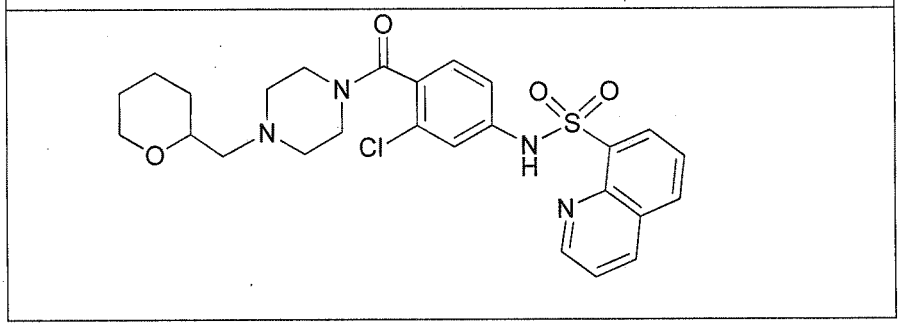


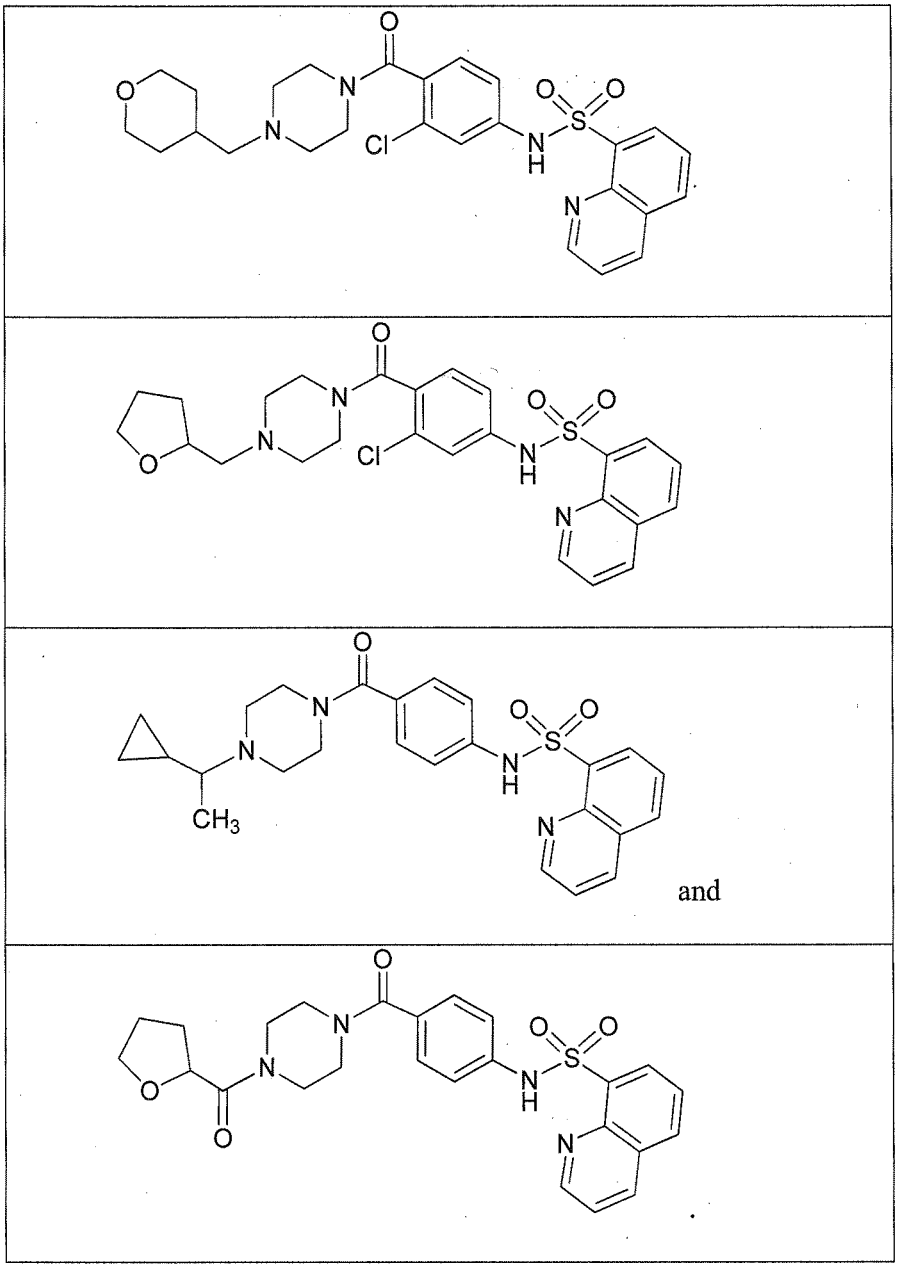






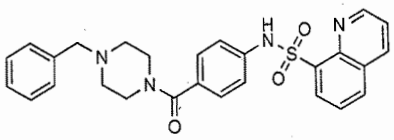
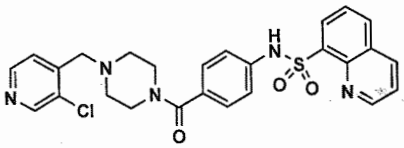
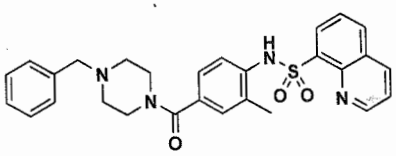
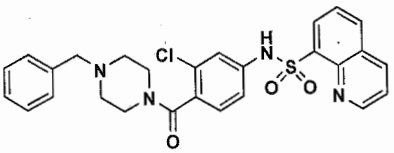
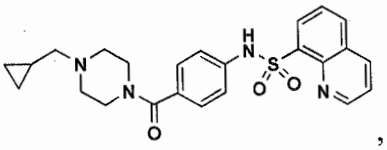
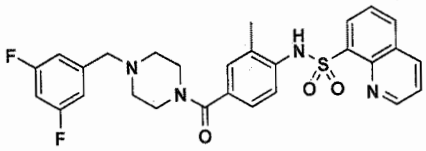
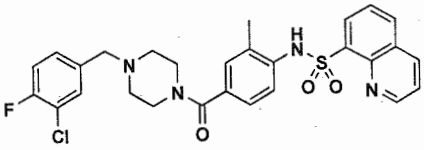
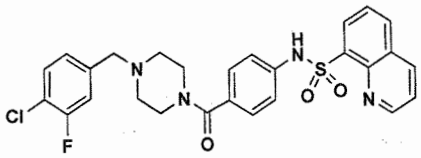
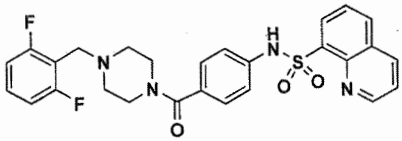
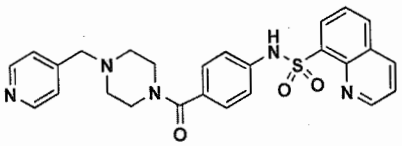
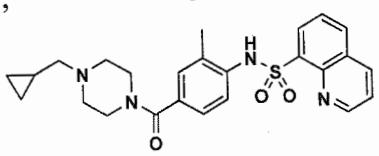
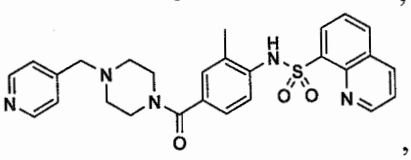
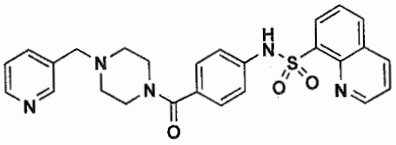
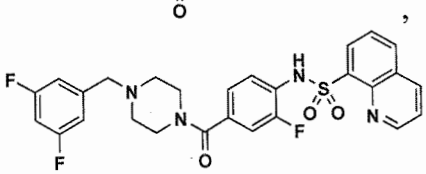
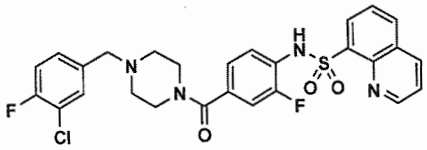
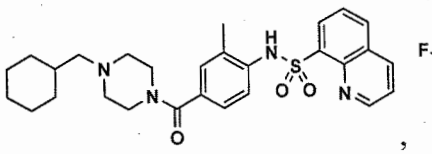
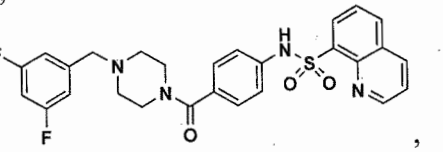
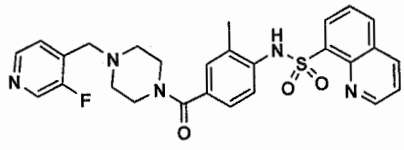
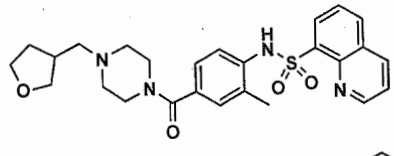
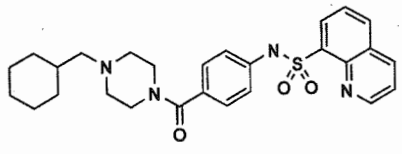
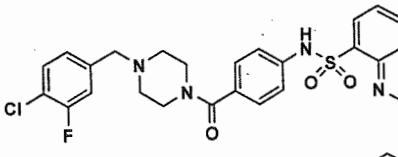
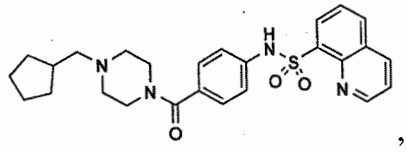
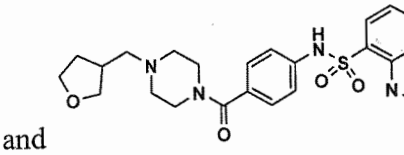


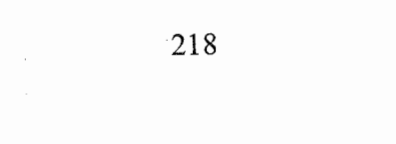




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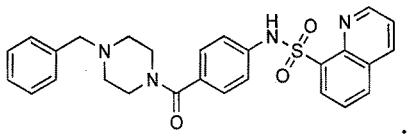
29. The use of any one of claims 1 to 9 or a pharmaceutically acceptable salt thereof, wherein the compound is selected from:


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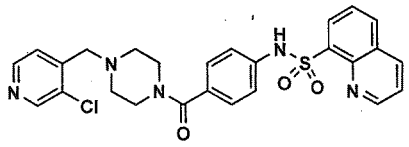
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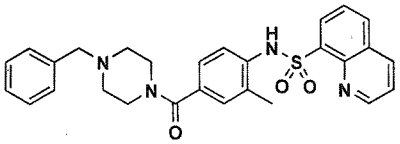
30. The use of any one of claims 1 to 9, wherein the compound is selected from:



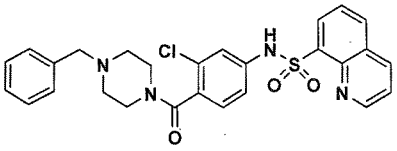
31. The use of any one of claims 1 to 9, wherein the compound is selected from:



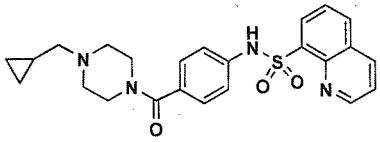
32. The use of any one of claims 1 to 9, wherein the compound is selected from:



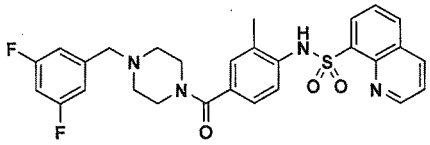
33. The use of any one of claims 1 to 9, wherein the compound is selected from:



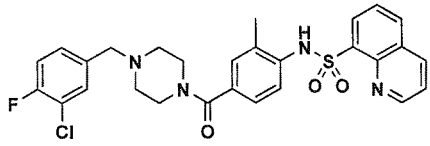
34. The use of any one of claims 1 to 9, wherein the compound is selected from:



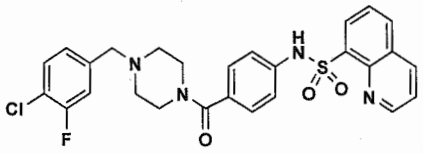
35. The use of any one of claims 1 to 9, wherein the compound is selected from:



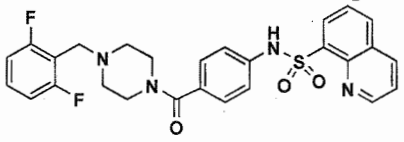
36. The use of any one of claims 1 to 9, wherein the compound is selected from:



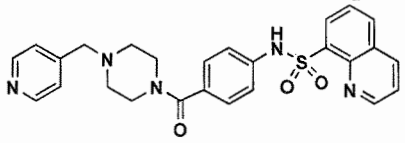
37. The use of any one of claims 1 to 9, wherein the compound is selected from:



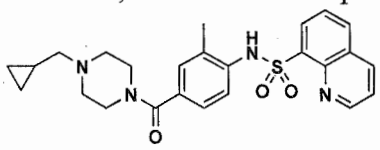
38. The use of any one of claims 1 to 9, wherein the compound is selected from:



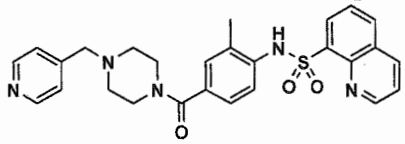
39. The use of any one of claims 1 to 9, wherein the compound is selected from:



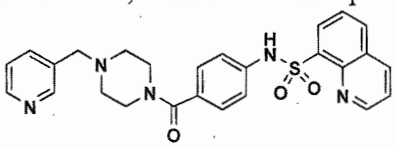
40. The use of any one of claims 1 to 9, wherein the compound is selected from:



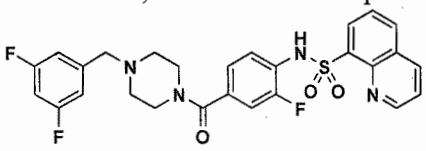
41. The use of any one of claims 1 to 9, wherein the compound is selected from:



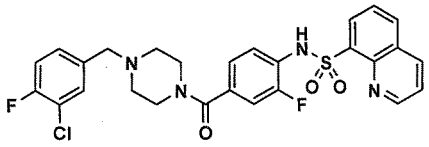
42. The use of any one of claims 1 to 9, wherein the compound is selected from:



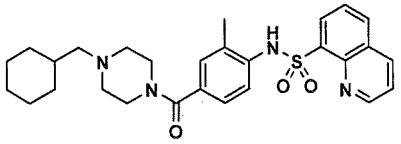
43. The use of any one of claims 1 to 9, wherein the compound is selected from:



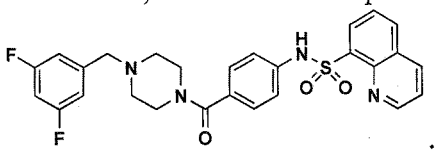
44. The use of any one of claims 1 to 9, wherein the compound is selected from:



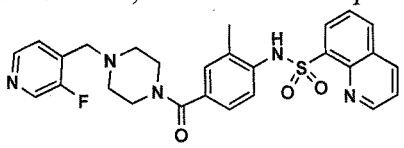
45. The use of any one of claims 1 to 9, wherein the compound is selected from:



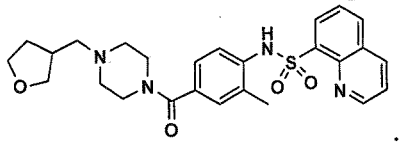
46. The use of any one of claims 1 to 9, wherein the compound is selected from:



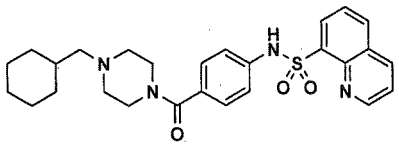
47. The use of any one of claims 1 to 9, wherein the compound is selected from:



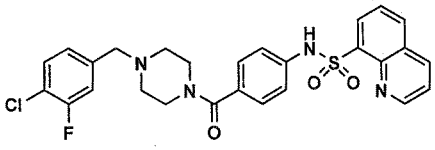
48. The use of any one of claims 1 to 9, wherein the compound is selected from:



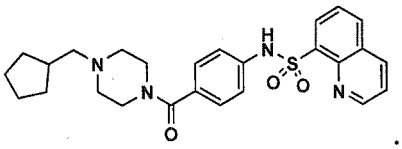
49. The use of any one of claims 1 to 9, wherein the compound is selected from:



50. The use of any one of claims 1 to 9, wherein the compound is selected from:



51. The use of any one of claims 1 to 9, wherein the compound is selected from:



52. The use of any one of claims 1 to 9, wherein the compound is selected from:

